DOCUMENT RESUME

ED 409 436 CE 074 356

TITLE	Technology Education. Vocational Education Program Courses Standards.
INSTITUTION	Florida State Dept. of Education, Tallahassee. Div. of Applied Tech., Adult, and Community Education.
PUB DATE	Jul 97
NOTE	388p.; Supersedes ED 361 581.
AVAILABLE FROM	Florida Department of Education, Product Distribution, Tallahassee, FL 32399 (order no. IA 483 BK 97).
PUB TYPE	Guides - Classroom - Teacher (052)
EDRS PRICE	EDRS Price MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	Behavioral Objectives; Communications; *Competency Based Education; Construction (Process); Drafting; *Electromechanical Technology; Electronic Equipment; Employment Qualifications; Engineering Technology; Entry Workers; Job Skills; Manufacturing; Postsecondary Education; *Power Technology; Secondary Education; State Curriculum Guides; *State Standards; *Statewide Planning; Student Evaluation; Teaching Guides; *Technology Education; Transportation
IDENTIFIERS	Florida

ABSTRACT

This document contains vocational education program course standards (curriculum frameworks and student performance standards) for exploratory courses, practical arts courses, and job preparatory programs offered at the secondary and postsecondary level as part of the technology education component of Florida's comprehensive vocational education program. The technology education courses standards are organized around, but not limited to, the technological categories of drafting, electronics, communications, construction, manufacturing, production, energy, power, transportation, aerospace, engineering, and supporting content areas. Curriculum frameworks are provided for 14 programs/clusters: integrated technology studies; orientation to technology; exploration of graphic communications technology; exploration of power and transportation technology; technology systems; technology applications I, II, and III; communications technology; construction technology; drafting and illustrative design technology; electronics technology; material and processes technology; and power and transportation technology. Each curriculum framework includes some or all of the following: program title, occupational area, grade level, length, certification awarded; major concepts/content covered in the course; laboratory activities; special notes; and intended outcomes. (KC)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

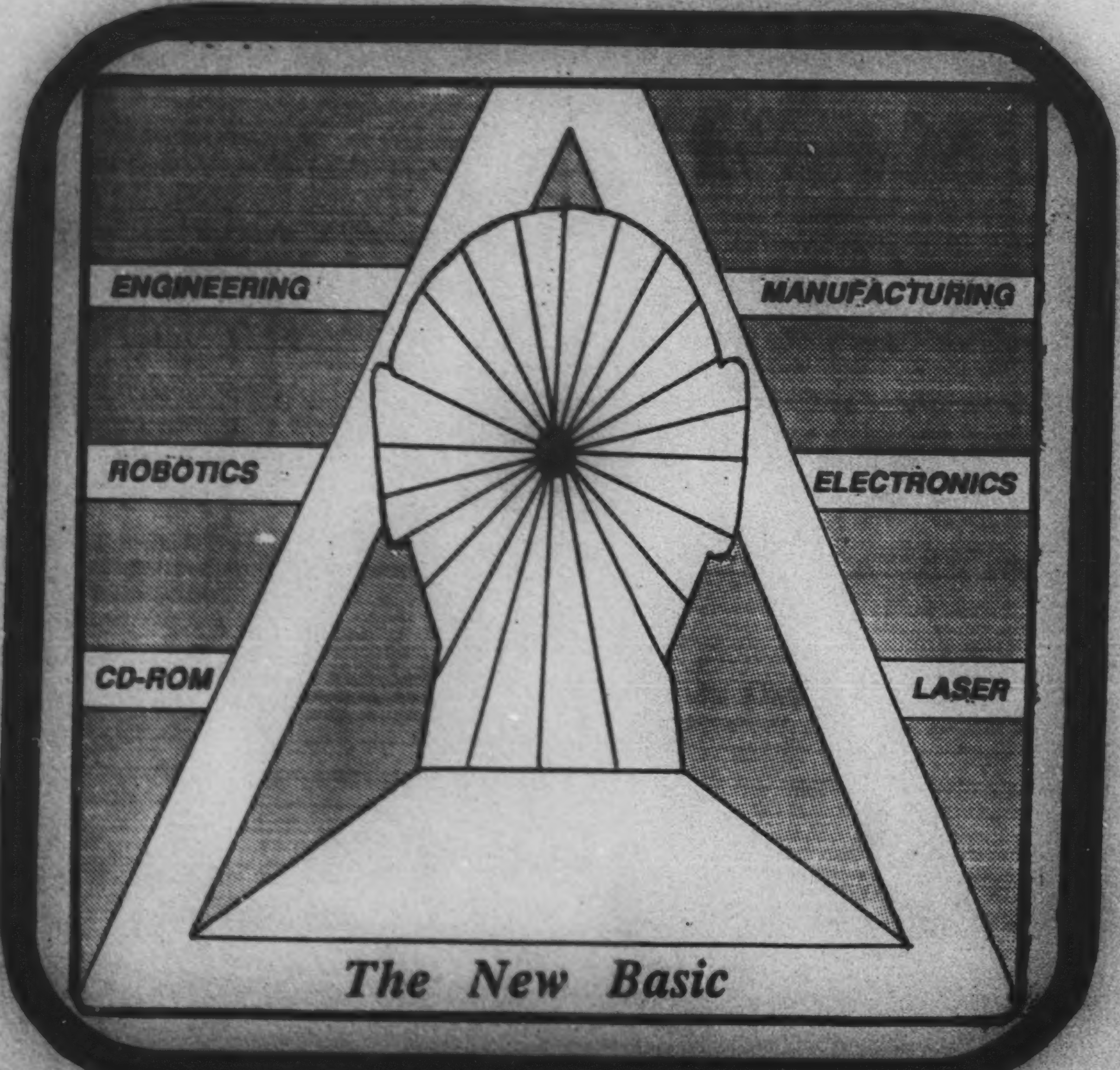
PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN OTHER THAN PAPER COPY HAS BEEN GRANTED BY
D. Hartsfield
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

ED 409 436

VOCATIONAL EDUCATION PROGRAM COURSES STANDARDS

July 1997

Technology Education


ENGINEERING
MANUFACTURING
ROBOTICS
ELECTRONICS
CD-ROM
LASER
The New Basic

CE074356

BEST COPY AVAILABLE

VOCATIONAL EDUCATION

PROGRAM COURSES STANDARDS

TECHNOLOGY EDUCATION

JULY 1997

FLORIDA DEPARTMENT OF EDUCATION

Division of Applied Technology and Adult Education

Bureau of System Implementation and Technical
Assistance for Vocational, Adult and Community
Tallahassee, Florida 32399-0400

904/488-1831

TABLE OF CONTENTS

Forward iii

Introduction v

Integrated Technology Studies 1
    Introduction to Technology
    Exploring Technology
    Exploration of Communications Technology
    Exploration of Production Technology
    Exploration of Aerospace Technology

Orientation to Technology 33

Exploration of Graphic Communications Technology 39

Exploration of Power & Transportation Technology 45

Technology Systems 51
    Communication Systems
    Power and Transportation Systems
    Production Systems
    Drafting and Design
    Electronics Systems
    Engineering Systems
    Applied Technology Systems
    Home Technology Systems

Technology Applications I 101
    Technology Studies I
    Production Technology I
    Engineering Technology I
    Aerospace Technology I

Technology Applications II 141
    Technology Studies II
    Production Technology II
    Engineering Technology II
    Aerospace Technology II

Technology Applications III 179
    Technology Studies III
    Production Technology III
    Engineering Technology III
    Aerospace Technology III

Communications Technology 217
    Communications Technology I
    Communications Technology II
    Communications Technology III

Construction Technology 245
    Construction Technology I
    Construction Technology II
    Construction Technology III

Drafting/ Illustrative Design Technology 275
    Drafting/ Illustrative Design Technology I
    Drafting/ Illustrative Design Technology II
    Drafting/ Illustrative Design Technology III

Electronics Technology 303
    Electronics Technology I
    Electronics Technology II
    Electronics Technology III

Material and Processes Technology 333
    Material and Processes Technology I
    Material and Processes Technology II
    Material and Processes Technology III

Power and Transportation Technology 359
    Power and Transportation Technology I
    Power and Transportation Technology II
    Power and Transportation Technology III

FOREWORD

Section 228.041 Florida Statutes defined vocational education as meaning that instruction not necessarily leading to a baccalaureate degree, either graded or ungraded, listed below:

1. Job/preparatory programs designed to provide students with the minimum competencies necessary for effective entry into an occupation;

2. Exploratory courses designed to give students initial exposure to the skills and aptitudes associated with a broad range of occupations in order to assist them in making informed decisions regarding their future academic and occupational goals.

3. Supplemental programs designed to enable persons who are or have been employed in an occupation to upgrade their competencies in order to reenter or maintain employment or advance within their current occupation;

4. Practical arts courses designed to teach students practical generic skills which, though applicable to some occupations, are not designed to prepare students for entry into a specific occupation; or;

5. Instruction which integrates the basic academic skills and vocational skills.

This document contains vocational education program courses standards (curriculum frameworks and students performance standards) for exploratory courses, practical arts courses and job preparatory programs offered at the secondary or postsecondary level as a part of Florida's comprehensive vocational education program. Vocational education program courses standards are established pursuant to Section 239.205, Section 233.011, and Section 232.2454, Florida Statutes, for school districts and community colleges. State Board of Education Rule 6A-6.0571, Criteria for Qualification of Special Vocational-Technical Education Program Courses, provides the basis for the development and dissemination of this document.

Each program courses standard is composed of two parts: A curriculum framework and student performance standards. The curriculum framework includes four major sections: major concepts/content, laboratory activities, special notes, and intended outcomes. Student performance standards are listed for each intended outcome.

The standards do not prescribe how instruction should be delivered since decisions relative to the delivery of instruction must be made by school districts and community colleges within the context of local conditions. The Division of Vocational, Adult and Community Education, Florida Department of Education, supports the belief that competency-based vocational education is the most effective means of providing programs and courses that conform to these established standards.

Program and course standards are based upon competencies required for entry, advancement, and upgrading in occupations in the vocational program areas of Agriculture, Business, Diversified, Health Occupations, Home Economics, Technology, Industrial. Marketing, and Public Service Education. Standards for courses designed for handicapped, disadvantaged, and other special needs persons are also provided. The standards are reviewed annually and revised as needed based upon changes in occupations utilizing input from professional associations, state technical committees, and other representatives for the private sector.

INTRODUCTION

TECHNOLOGY EDUCATION

Rapid advances in technology are forcing changes in educational content and methodology and are pointing out the necessity for preparing students who need to be technologically literate and ready for the future. We are in the midst of a technology explosion that will continue into the 21st century. It is altering our lifestyle and, of course, our work style. Citizens of Florida must understand technology as an integral part of our everyday lives. That is why teaching about technology and its impact on all of us is of vital importance at all grade levels in our schools. It is a fundamental study for all persons, regardless of educational or career goal.

Technology Education is responding to the realities of a new age that requires students to be prepared with universally transferable technological skills for life and success in a modern world. It is an educational program that teaches students how to survive in a modern world. It is an educational program that teaches students how to survive in an economy that needs, uses, and rewards an array of human talents much wider than the narrower academic and occupational skills that are traditionally taught. Technology Education provides a setting to strategically teach essential skills. It is a logical link in the educational process that treats both academic and vocational skills in a theoretical and applied way. Students are provided optimum experiences, both abstract and concrete, through the applied study of technological tools, materials, systems, and processes. This is a type of learning that allows students to make sense out of their world and provides the correct balance of depth and breadth to enable them to deal with a world of dazzling change and complexity. Students in Technology Education learn to apply problem-solving skills to the solution of community, industry, life problems, and technological issues facing Florida. They develop an attitude that learning is a lifelong process. They recognize the consequences of technology on the individual and society. The end result is a new educational essential called technological literacy. It not only enables our youth to be technologically informed, but to also have technological understanding. It enables our youth to be technologically wise, as well as technologically smart.

The program of Technology Education is organized around, but not limited to, the technological categories of drafting, electronics, communications, construction, manufacturing, production, energy, power, transportation, aerospace, engineering, and supporting content areas. Applied learning activities are conducted in a laboratory setting with a minimum of 75 percent hands-on experiences with technological tools, machines, instruments, materials, processes, and systems.

Consistent with individual abilities, interests, and needs, the student will:

1. Establish a knowledge and appreciation for the importance of technology.
2. Apply technological tools, machines, instruments, materials, processes, and systems safely and effectively.
3. Develop the skills, creative abilities, positive self-concepts, and individual capabilities to use a variety of technologies.

4. Develop problem-solving and decision-making abilities using technical means.
5. Apply other school subjects appropriate to technology content, instruction, and laboratory activities.
6. Understand technology as a base for career opportunities.
7. Uncover and develop individual talents and interests.
8. Adjust to a changing environment.
9. Become a wiser consumer.
10. Develop a positive attitude toward lifelong learning.
11. Deal with forces that influence the future.
12. Demonstrate an understanding of entrepreneurship.
13. Demonstrate positive human relations, leadership skills, organizational abilities, and technological literacy through participation in the Florida Technology Student Association (FL-TSA).

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Integrated Technology Studies
Occupational Area:	Technology Education
	Secondary
Program Numbers	**8600000**
CIP Number	0821.0122EX
Grade Level	6-9, 30, 31
Length	0.5 credits
Certification	I ART-TEC 1 @2 IND ARTS @4 @6

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this program is to provide students with a foundation of knowledge and technically oriented experiences in the study of the applications of technology and its effect upon our lives and the choosing of an occupation. The content and activities will also include the study of entrepreneurship, safety, and leadership skills. This program focuses on transferable skills and stresses understanding and demonstration of the technological tools, machines, instruments, materials, processes and systems in business and industry.

The emphasis of this program is on developing awareness of future needs, developing technological competence, confidence and awareness through interaction with technologies, developing awareness of other vocational programs, interacting with business, industry and community organizations, applying basic skills in learning activities, and developing self-awareness of individual abilities, needs and interests. The courses are intended to help students develop their problem-solving skills and creativity while learning about technology and careers. Students will learn to gather data through research and testing, as well as to record the results of their laboratory experiments.

The content includes introductory studies in areas of technology which introduce students to the development of abilities to calculate, make important observations, analyze and solve problems using manipulative skills while working cooperatively with others in team activities.

Listed below are the courses that make up this program at the secondary level followed by the laboratory design code appropriate for each course:

8600010 - Introduction to Technology (240)
8600020 - Exploring Technology (240)
8600030 - Exploration of Communications Technology (240)
8600040 - Exploration of Production Technology (240)
8600050 - Exploration of Aerospace Technology 95-96 (240)

II. **LABORATORY ACTIVITIES**: Instruction and learning activities are provided in a laboratory setting using hands-on experiences with technology equipment, tools and materials appropriate to the course content.

III. **SPECIAL NOTE**: The Florida Technology Student Association (FL-TSA)is the appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. Vocational student organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

IV. **INTENDED OUTCOMES**: After successfully completing a course the student will be able to:

01.0 Demonstrate proper and safe procedures while working with technological tools, apparatus, equipment, systems, and materials.
02.0 Exhibit positive human relations and leadership skills.
03.0 Demonstrate computer application and literacy.
04.0 Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05.0 Demonstrate and apply design/problem-solving processes.
06.0 Demonstrate technological literacy.
07.0 Display an understanding and appreciation for the dignity and worth of honest labor.
08.0 Discuss individual interests and aptitudes as they relate to a career.
09.0 Develop the idea that technology is the application of knowledge to solve human problems and extend capabilities.
10.0 Describe positive and negative impacts of technology.
11.0 Identify resources of technology.
12.0 Utilize the systems approach in technology.
13.0 Utilize tools, machines, and equipment in the technology laboratory.
14.0 Identify evolving technologies in our technological world.
15.0 Perform special skills unique to electronics, computers, and the technology systems of communications manufacturing, construction, energy, power, and transportation.
16.0 Express a knowledge of the essential elements and organization of the free enterprise system.
17.0 List requisites and employment opportunities for employment in today's and our future technological world.
18.0 Identify kinds and levels of work common to today's and our future technological world.
19.0 List requisites and career opportunities for employment in the occupations relating to communications technology.
20.0 Perform special skills unique to communications technology.
21.0 Express a knowledge of factors that impact on communications technology and practices.
22.0 Identify evolving Technologies of Production Systems.
23.0 Perform special skills unique to Manufacturing Technology.
24.0 Express a knowledge of factors that impact on Manufacturing Technologies and practices.

25.0 Perform special skills unique to Construction Technology.

26.0 Express a knowledge of factors that impact on Construction Technology and practices.

27.0 Identify kinds and levels of work common to Production Technology.

28.0 Demonstrate knowledge of the basic principles of aerostatics and aerodynamics.

29.0 Identify and demonstrate knowledge of both liquid and solid propellent rocket propulsion systems.

30.0 Define, describe and demonstrate composite materials processing and use in airframe fabrication.

31.0 Define and describe the stages and forms of interference in a basic or satellite communication systems.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Integrated Technology Studies
Secondary Number: 8600000
Postsecondary Number:

01.0 DEMONSTRATE PROPER AND SAFE PROCEDURES WHILE WORKING WITH TECHNOLOGICAL TOOLS, APPARATUS, EQUIPMENT, SYSTEMS, AND MATERIALS--The student will be able to:

01.01 Follow laboratory safety rules and procedures.
01.02 Demonstrate good housekeeping at work station within total laboratory.
01.03 Conduct laboratory activities and equipment operations in a safe manner.
01.04 Exercise care and respect for all tools, equipment, and materials.
01.05 Identify color-coding safety standards.
01.06 Safely use hand tools and power equipment.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 EXHIBIT POSITIVE HUMAN RELATIONS AND LEADERSHIP SKILLS--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Work cooperatively with others.

03.0 DEMONSTRATE COMPUTER APPLICATION AND LITERACY--The student will be able to:

03.01 Define terms related to computer parts and usage.
03.02 List ways in which computers are used in technology.
03.03 Discuss advantages and disadvantages in the use of computers.
03.04 Demonstrate the application of a computer.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Use the features of books and reference materials, such as table of contents, preface, introduction, titles and subtitles, index, glossary, appendix, bibliography.
04.02 Read and follow complex written directions.
04.03 Find, understand, and apply information from a variety of sources (books, manuals, newspapers, periodicals, directories, reference works, computer printouts, and other printed matter or electronic sources such as video display terminals.

04.04 Use and expand general and specialized vocabulary (including abbreviations, acronyms, and concepts) As appropriate to subject areas studied at the grade level.

04.05 Write Standard English sentences with correct:
- sentence structure;
- verb forms;
- punctuation, capitalization, possessives, plural forms, and other matters of mechanics;
- word choice and spelling.

04.06 Answer and ask questions coherently and concisely, and follow spoken instructions.

04.07 Identify and comprehend the main and subordinate ideas in lectures and discussions, ask questions to clarify information heard, and report accurately what others have said.

04.08 Perform with accuracy the computations of addition, subtraction, multiplication, and division using natural numbers, fractions, decimals and integers.

04.09 Make and use measurements in both traditional and metric units.

04.10 Formulate and solve problems in mathematical terms, selecting appropriate approaches and tools (mental computation, trial and error, paper-and-pencil techniques, calculator, and computer).

04.11 Solve work-related problems involving the basic arithmetic oper-ations using whole numbers, fractions, decimals, and percents.

04.12 Describe the role of observation and experimentation in the development of scientific theories.

04.13 Gather scientific information through skills in laboratory, field and library work.

04.14 Draw conclusions or make inferences from data.

04.15 Apply basic scientific/technical solutions to the appropriate problems.

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.

05.03 Design and implement the optimal solution to a given problem.

06.0 DEMONSTRATE TECHNOLOGICAL LITERACY--The student will be able to:

06.01 Outline major historical technological developments or events.

06.02 Identify recent advances in technology.

06.03 Explain problem-solving roles of technology.

06.04 Forecast a technological development or event.

06.05 Make a technological decision.

06.06 Define technology.

07.0 DISPLAY AN UNDERSTANDING AND APPRECIATION FOR THE DIGNITY AND WORTH OF HONEST LABOR--The student will be able to:

07.01 Form an understanding and appreciation for work after listening to or observing technology workers.

07.02 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
07.03 Form an understanding and appreciation for the roles and work of co-workers.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEVELOP THE IDEA THAT TECHNOLOGY IS THE APPLICATION OF KNOWLEDGE TO SOLVE HUMAN PROBLEMS AND EXTEND CAPABILITIES--The student will be able to:

09.01 Discuss the impacts of technology on work, job opportunities, and careers.
09.02 Discuss the outputs of technology, now and in the future.
09.03 Discuss how technology can solve and/or create problems.
09.04 Discuss expected and unexpected outputs of technology.
09.05 Identify a problem affecting human life in your community and utilize problem-solving skills and teamwork to find a solution.

10.0 DESCRIBE POSITIVE AND NEGATIVE IMPACTS OF TECHNOLOGY--The student will be able to:

10.01 Explain the term "impact".
10.02 Explain ways in which technology influences/affects his/her life and the environment.
10.03 Categorize impacts as "desirable" or "undesirable".
10.04 Suggest ways of minimizing undesirable impacts and protecting the environment.

11.0 IDENTIFY RESOURCES OF TECHNOLOGY--The student will be able to:

11.01 Define the term "resource".
11.02 Identify major categories of resources of technology.
11.03 List specific examples of resources of technology.
11.04 Categorize examples of resources of technology.
11.05 Explain how technological development is dependent upon resources.
11.06 Utilize technological resources to produce a product.

12.0 UTILIZE THE SYSTEMS APPROACH IN TECHNOLOGY--The student will be able to:

12.01 Define the term "system" as used in technology.
12.02 Identify and explain major components of a system.
12.03 Draw and label a basic system model.
12.04 Describe common examples of technological systems.
12.05 Construct and/or operate a simple technological system.

13.0 UTILIZE TOOLS, MACHINES, AND EQUIPMENT IN THE TECHNOLOGY LABORATORY--The student will be able to:

- 13.01 Identify tools, machines, materials and equipment and describe their functions.
- 13.02 Select appropriate tools, machines, and equipment to accomplish a given task.
- 13.03 Demonstrate safe and correct use of tools, machines, and equipment.

14.0 IDENTIFY EVOLVING TECHNOLOGIES IN OUR TECHNOLOGICAL WORLD--The student will be able to:

- 14.01 List evolving technologies.
- 14.02 Report on a recent or evolving technology.

15.0 PERFORM SPECIAL SKILLS UNIQUE TO ELECTRONICS, COMPUTERS AND THE TECHNOLOGY SYSTEMS OF COMMUNICATIONS, CONSTRUCTION, MANUFACTURING, ENERGY, POWER, AND TRANSPORTATION--The student will be able to:

- 15.01 Perform electronic technology laboratory activities.
  - 15.01.01 Define Electronic Systems.
  - 15.01.02 Conduct electronic systems experiments using input, process, and output.
- 15.02 Perform computer technology laboratory activities.
  - 15.02.01 Define computer technology.
  - 15.02.02 Conduct computer controlled experiments.
- 15.03 Perform special skills unique to communications operations.
  - 15.03.01 Perform basic drafting skills using traditional tools, instruments, and methods.
  - 15.03.02 Perform basic drafting skills using today's technology.
- 15.04 Perform construction technology laboratory activities.
  - 15.04.01 Perform basic construction skills using traditional tools, equipment and methods.
  - 15.04.02 Perform basic construction skills using today's technology, tools, equipment, and methods.
- 15.05 Perform special skills unique to manufacturing technology.
  - 15.05.01 Perform basic production skills using traditional tools, equipment, and methods.
  - 15.05.02 Perform basic production skills using today's technology, tools, equipment, and methods (CAD/CAM, CNC, Robots, Work Cell, etc.).
- 15.06 Perform special skills unique to energy, power, and transportation technology.
  - 15.06.01 Perform basic energy, power, and transportation skills using traditional tools, equipment and methods.
  - 15.06.02 Perform basic energy, power, and transportation skills using today's technology, tools, equipment and methods.

16.0 EXPRESS A KNOWLEDGE OF THE ESSENTIAL ELEMENTS AND ORGANIZATION OF THE FREE ENTERPRISE SYSTEM--The student will be able to:

16.01 Outline the main functions of research and development, personnel management, production, quality control, and marketing.

16.02 Participate in a simulated technology organization incorporating the five above elements.

17.0 LIST REQUISITES AND EMPLOYMENT OPPORTUNITIES FOR EMPLOYMENT IN TODAY'S AND OUR FUTURE TECHNOLOGICAL WORLD--The student will be able to:

17.01 List occupations, job requirements and employment opportunities in communications technology.

17.02 List occupations, job requirements and employment opportunities in construction technology.

17.03 List occupations, job requirements and employment opportunities in manufacturing technology.

17.04 List occupations, job requirements and employment opportunities in energy, power, and transportation technology.

17.05 List related occupations and academic courses available at the secondary and postsecondary levels.

18.0 IDENTIFY KINDS AND LEVELS OF WORK COMMON TO TECHNOLOGY--The student will be able to:

18.01 Identify kinds of work as a technology craftsperson.

18.02 Identify kinds of work as a technology technician.

18.03 Identify kinds of work as a technology engineer or scientist.

18.04 Identify kinds of work in technology management.

18.05 Identify other kinds of technology work.

19.0 LIST REQUISITES AND CAREER OPPORTUNITIES FOR EMPLOYMENT IN COMMUNICATIONS TECHNOLOGY--The student will be able to:

19.01 List occupations, job requirements, and employment opportunities in graphic communication technology.

19.02 Identify kinds of work related to various communications occupations.

19.03 List occupational training programs and academic programs at the postsecondary levels in graphic communications technologies.

19.04 Express a knowledge of communications technology labor organizations and hiring practices.

19.05 Identify recent advances in technology and evolving technologies in communications.

19.06 Report on a recent evolving technology in communications.

20.0 PERFORM SPECIAL SKILLS UNIQUE TO COMMUNICATIONS TECHNOLOGY--The student will be able to:

20.01 Identify and use basic drafting tools and instruments for making drawings.

BEST COPY AVAILABLE

20.02 Explain the processes of relief, gravur, screen process, and lithographic printing; bindery operations; photographic reproduction; and electronic communications.
20.03 Use proper layout and design skills for producing a printed product.
20.04 Produce a product utilizing screen process printing technology and skills.
20.05 Produce a product utilizing lithographic printing technology and skills.
20.06 Produce a print utilizing photographic technology and skills.
20.07 Use bindery skills to produce a book or booklet.
20.08 Apply technical knowledge and skills related to two or more of the following areas of electronic communications: telephone, radio, television, digital data transmission, and satellite communications.

21.0 EXPRESS A KNOWLEDGE OF FACTORS THAT IMPACT ON COMMUNICATIONS TECHNOLOGY AND PRACTICES--The student will be able to:

21.01 Explain economic factors that impact on graphic communications technology.
21.02 Research and identify styles and types of printed products desired by customers or consumers.
21.03 Identify the natural and synthetic resources required for papers, inks, rollers, and solutions used in graphic communications technology.

22.0 IDENTIFY EVOLVING TECHNOLOGIES OF PRODUCTIONS SYSTEMS--The student will be able to:

22.01 Participate in a discussion about evolving technologies of manufacturing systems and construction processes.
22.02 List evolving technologies of manufacturing and construction industries.
22.03 Brainstorm futuristic production systems.

23.0 PERFORM SPECIAL SKILLS UNIQUE TO MANUFACTURING TECHNOLOGY--The student will be able to:

23.01 Design a product for custom or mass production manufacturing.
23.02 Plan a mass production system for manufacturing a product.
23.03 Perform materials forming practices such as casting or molding, and compressing or stretching.
23.04 Perform materials separating practices such as shearing, chip removing, and other separating processes.
23.05 Perform materials conditioning practices such as heat treating, physical conditioning, or through chemical reactions.
23.06 Combine components through mixing, coating, bonding, and mechanical fastening.
23.07 Assemble a product or a subassembly of a product.

24.0 EXPRESS A KNOWLEDGE OF FACTORS THAT IMPACT ON MANUFACTURING TECHNOLOGY AND PRACTICES--The student will be able to:

24.01 Explain economic factors that impact on manufacturing technology.
24.02 Research and identify consumer demands for a manufactured product.
24.03 Identify sources of raw materials and/or standard stock materials needed for a manufactured product.
24.04 Interview, hire, train, or promote an applicant or employee for a simulated mass production manufacturing activity.
24.05 Define the terms "organized labor" and "collective bargaining."
24.06 Prepare a plan for marketing and distributing a manufactured product.

25.0 PERFORM SPECIAL SKILLS UNIQUE TO CONSTRUCTION TECHNOLOGY--The student will be able to:

25.01 Interpret construction plans and blueprints.
25.02 Identify construction materials.
25.03 Apply carpentry skills.
25.04 Apply plumbing skills.
25.05 Apply electrical wiring skills.
25.06 Apply masonry skills.
25.07 Describe or demonstrate the construction skills of plastering, roofing and finishing.

26.0 EXPRESS A KNOWLEDGE OF FACTORS THAT IMPACT ON CONSTRUCTION TECHNOLOGY AND PRACTICES--The student will be able to:

26.01 Explain economic factors that impact on construction technology.
26.02 Research and identify types and styles of construction desired by consumers.
26.03 List sources of raw materials and standard stock materials available to construction technology.
26.04 Express a knowledge of construction technology labor organizations and hiring practices.

27.0 IDENTIFY KINDS AND LEVELS OF WORK COMMON TO PRODUCTION TECHNOLOGY--The student will be able to:

27.01 Identify kinds of work related to manufacturing technologies.
27.02 Identify semiskilled, skilled, and professional levels of work in manufacturing construction technology.
27.03 List occupations, job requirements, and employment opportunities in manufacturing technology.
27.04 List occupational training programs and academic programs at the secondary/post secondary levels in manufacturing technologies.
27.05 List occupations, job requirements and employment opportunities in construction technology.
27.06 List occupational training programs and academic programs at the secondary/post secondary levels in construction technologies.

28.0 DEMONSTRATE KNOWLEDGE OF THE BASIC PRINCIPLES OF AEROSTATICS AND AERODYNAMICS--The student will be able to:

28.01 State definitions of terms associated with aerostatics and aerodynamics.
28.02 State the Buoyancy Principle.
28.03 State Bernoulli's Principle.
28.04 Match basic forces acting on an aerodyne in flight to their correct definition.
28.05 State descriptions of the basic parts of a glider.
28.06 State definitions of the components of the cross-sectional shape of an aircraft's wing.
28.07 Build an aerostatic vehicle.
28.08 Build an aerodynamic vehicle.

29.0 IDENTIFY AND DEMONSTRATE KNOWLEDGE OF BOTH LIQUID AND SOLID PROPELLENT ROCKET PROPULSION SYSTEMS--The student will be able to:

29.01 Match terms associated with propulsion systems to their correct definitions.
29.02 State definitions of types of rocket propulsion systems.
29.03 Match parts of a solid-propellant rocket engine to their correct definitions.
29.04 Match parts of a liquid-propellant rocket engine to their correct definitions.
29.05 Discuss the principle of rocket propulsion.
29.06 Label the major units of the Space Shuttle's propulsion systems.
29.07 Identify the major components of the Space Shuttle's main engines.
29.08 Label the major components of the Space Shuttle's external tank.
29.09 Identify the major components of the Space Shuttle's solid-rocket boosters.
29.10 Compare the propulsion systems of solid and liquid-propellant rockets.
29.11 Simulate a multi-stage rocket launch.
29.12 Construct a solid-propellant model rocket.

30.0 DEFINE, DESCRIBE AND DEMONSTRATE COMPOSITE MATERIALS PROCESSING AND USE IN AIRFRAME FABRICATION--The student will be able to:

30.01 Match terms associated with airframe manufacturing to their correct definitions.
30.02 Match components of the manufacturing system model to their correct definitions.

31.0 DEFINE AND DESCRIBE THE STAGES AND FORMS OF INTERFERENCE IN A BASIC OR SATELLITE COMMUNICATION SYSTEMS--The student will be able to:

31.01 State definitions of the terms communication and interference.
31.02 List and define the stages of a basic communication system.
31.03 Describe forms of interference that can occur at various stages in a basic communication system.

31.04 Discuss the importance of feed back in a basic communication system.

31.05 Define parts of the process in a basic communication system.

31.06 Describe the parts of the process in a satellite communication system.

31.07 Describe the parts of the process in a helium-neon laser communication system.

31.08 Use a laser to simulate satellite communications.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600010
Course Title: Introduction to Technology
Course Credit: 0.5

COURSE DESCRIPTION:

01.0 DEMONSTRATE PROPER AND SAFE PROCEDURES WHILE WORKING WITH TECHNOLOGICAL TOOLS, APPARATUS, EQUIPMENT, SYSTEMS, AND MATERIALS--The student will be able to:

01.01 Follow laboratory safety rules and procedures.
01.02 Demonstrate good housekeeping at work station within total laboratory.
01.03 Conduct laboratory activities and equipment operations in a safe manner.
01.04 Exercise care and respect for all tools, equipment, and materials.
01.05 Identify color-coding safety standards.
01.06 Safely use hand tools and power equipment.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 EXHIBIT POSITIVE HUMAN RELATIONS AND LEADERSHIP SKILLS--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Work cooperatively with others.

03.0 DEMONSTRATE COMPUTER APPLICATION AND LITERACY--The student will be able to:

03.01 Define terms related to computer parts and usage.
03.02 List ways in which computers are used in technology.
03.03 Discuss advantages and disadvantages in the use of computers.
03.04 Demonstrate the application of a computer.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Use the features of books and reference materials, such as table of contents, preface, introduction, titles and subtitles, index, glossary, appendix, bibliography.
04.02 Read and follow complex written directions.

04.03 Find, understand, and apply information from a variety of sources (books, manuals, newspapers, periodicals, directories, reference works, computer printouts, and other printed matter or electronic sources such as video display terminals.

04.04 Use and expand general and specialized vocabulary (including abbreviations, acronyms, and concepts) As appropriate to subject areas studied at the grade level.

04.05 Write Standard English sentences with correct:

- sentence structure;
- verb forms;
- punctuation, capitalization, possessives, plural forms, and other matters of mechanics;
- word choice and spelling.

04.06 Answer and ask questions coherently and concisely, and follow spoken instructions.

04.07 Identify and comprehend the main and subordinate ideas in lectures and discussions, ask questions to clarify information heard, and report accurately what others have said.

04.08 Perform with accuracy the computations of addition, subtraction, multiplication, and division using natural numbers, fractions, decimals and integers.

04.09 Make and use measurements in both traditional and metric units.

04.10 Formulate and solve problems in mathematical terms, selecting appropriate approaches and tools (mental computation, trial and error, paper-and-pencil techniques, calculator, and computer).

04.11 Solve work-related problems involving the basic arithmetic oper-ations using whole numbers, fractions, decimals, and percents.

04.12 Describe the role of observation and experimentation in the development of scientific theories.

04.13 Gather scientific information through skills in laboratory, field and library work.

04.14 Draw conclusions or make inferences from data.

04.15 Apply basic scientific/technical solutions to the appropriate problems.

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.

05.03 Design and implement the optimal solution to a given problem.

06.0 DEMONSTRATE TECHNOLOGICAL LITERACY--The student will be able to:

06.01 Outline major historical technological developments or events.

06.02 Identify recent advances in technology.

06.03 Explain problem-solving roles of technology.

06.04 Forecast a technological development or event.

06.05 Make a technological decision.

06.06 Define technology.

07.0 DISPLAY AN UNDERSTANDING AND APPRECIATION FOR THE DIGNITY AND WORTH OF HONEST LABOR--The student will be able to:

07.01 Form an understanding and appreciation for work after listening to or observing technology workers.
07.02 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
07.03 Form an understanding and appreciation for the roles and work of co-workers.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEVELOP THE IDEA THAT TECHNOLOGY IS THE APPLICATION OF KNOWLEDGE TO SOLVE HUMAN PROBLEMS AND EXTEND CAPABILITIES--The student will be able to:

09.01 Discuss the impacts of technology on work, job opportunities, and careers.
09.02 Discuss the outputs of technology, now and in the future.
09.03 Discuss how technology can solve and/or create problems.
09.04 Discuss expected and unexpected outputs of technology.
09.05 Identify a problem affecting human life in your community and utilize problem-solving skills and teamwork to find a solution.

10.0 DESCRIBE POSITIVE AND NEGATIVE IMPACTS OF TECHNOLOGY--The student will be able to:

10.01 Explain the term "impact".
10.02 Explain ways in which technology influences/affects his/her life and the environment.
10.03 Categorize impacts as "desirable" or "undesirable".
10.04 Suggest ways of minimizing undesirable impacts and protecting the environment.

11.0 IDENTIFY RESOURCES OF TECHNOLOGY--The student will be able to:

11.01 Define the term "resource".
11.02 Identify major categories of resources of technology.
11.03 List specific examples of resources of technology.
11.04 Categorize examples of resources of technology.
11.05 Explain how technological development is dependent upon resources.
11.06 Utilize technological resources to produce a product.

12.0 UTILIZE THE SYSTEMS APPROACH IN TECHNOLOGY--The student will be able to:

12.01 Define the term "system" as used in technology.

12.02 Identify and explain major components of a system.
12.03 Draw and label a basic system model.
12.04 Describe common examples of technological systems.
12.05 Construct and/or operate a simple technological system.

13.0 UTILIZE TOOLS, MACHINES, AND EQUIPMENT IN THE TECHNOLOGY LABORATORY--The student will be able to:

13.01 Identify tools, machines, materials and equipment and describe their functions.
13.02 Select appropriate tools, machines, and equipment to accomplish a given task.
13.03 Demonstrate safe and correct use of tools, machines, and equipment.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600020
Course Title: Exploring Technology
Course Credit: 0.5

COURSE DESCRIPTION:

01.0 DEMONSTRATE PROPER AND SAFE PROCEDURES WHILE WORKING WITH TECHNOLOGICAL TOOLS, APPARATUS, EQUIPMENT, SYSTEMS, AND MATERIALS--The student will be able to:

- 01.01 Follow laboratory safety rules and procedures.
- 01.02 Demonstrate good housekeeping at work station within total laboratory.
- 01.03 Conduct laboratory activities and equipment operations in a safe manner.
- 01.04 Exercise care and respect for all tools, equipment, and materials.
- 01.05 Identify color-coding safety standards.
- 01.06 Safely use hand tools and power equipment.
- 01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
- 01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 EXHIBIT POSITIVE HUMAN RELATIONS AND LEADERSHIP SKILLS--The student will be able to:

- 02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
- 02.02 Work cooperatively with others.

03.0 DEMONSTRATE COMPUTER APPLICATION AND LITERACY--The student will be able to:

- 03.01 Define terms related to computer parts and usage.
- 03.02 List ways in which computers are used in technology.
- 03.03 Discuss advantages and disadvantages in the use of computers.
- 03.04 Demonstrate the application of a computer.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

- 04.01 Use the features of books and reference materials, such as table of contents, preface, introduction, titles and subtitles, index, glossary, appendix, bibliography.
- 04.02 Read and follow complex written directions.
- 04.03 Find, understand, and apply information from a variety of sources (books, manuals, newspapers, periodicals, directories,

reference works, computer printouts, and other printed matter or electronic sources such as video display terminals.

04.04 Use and expand general and specialized vocabulary (including abbreviations, acronyms, and concepts) As appropriate to subject areas studied at the grade level.

04.05 Write Standard English sentences with correct:
- sentence structure;
- verb forms;
- punctuation, capitalization, possessives, plural forms, and other matters of mechanics;
- word choice and spelling.

04.06 Answer and ask questions coherently and concisely, and follow spoken instructions.

04.07 Identify and comprehend the main and subordinate ideas in lectures and discussions, ask questions to clarify information heard, and report accurately what others have said.

04.08 Perform with accuracy the computations of addition, subtraction, multiplication, and division using natural numbers, fractions, decimals and integers.

04.09 Make and use measurements in both traditional and metric units.

04.10 Formulate and solve problems in mathematical terms, selecting appropriate approaches and tools (mental computation, trial and error, paper-and-pencil techniques, calculator, and computer).

04.11 Solve work-related problems involving the basic arithmetic oper-ations using whole numbers, fractions, decimals, and percents.

04.12 Describe the role of observation and experimentation in the development of scientific theories.

04.13 Gather scientific information through skills in laboratory, field and library work.

04.14 Draw conclusions or make inferences from data.

04.15 Apply basic scientific/technical solutions to the appropriate problems.

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.

06.0 DEMONSTRATE TECHNOLOGICAL LITERACY--The student will be able to:

06.01 Outline major historical technological developments or events.
06.02 Identify recent advances in technology.
06.03 Explain problem-solving roles of technology.
06.04 Forecast a technological development or event.
06.05 Make a technological decision.
06.06 Define technology.

07.0 DISPLAY AN UNDERSTANDING AND APPRECIATION FOR THE DIGNITY AND WORTH OF HONEST LABOR--The student will be able to:

BEST COPY AVAILABLE

- 07.01 Form an understanding and appreciation for work after listening to or observing technology workers.
- 07.02 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
- 07.03 Form an understanding and appreciation for the roles and work of co-workers.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

- 08.01 Describe individual strengths and weaknesses.
- 08.02 Discuss individual interests related to a career.
- 08.03 Identify careers within specific areas of technology.
- 08.04 Explore careers within specific areas of interest.

14.0 IDENTIFY EVOLVING TECHNOLOGIES IN OUR TECHNOLOGICAL WORLD--The student will be able to:

- 14.01 List evolving technologies.
- 14.02 Report on a recent or evolving technology.

15.0 PERFORM SPECIAL SKILLS UNIQUE TO ELECTRONICS, COMPUTERS AND THE TECHNOLOGY SYSTEMS OF COMMUNICATIONS, CONSTRUCTION, MANUFACTURING, ENERGY, POWER, AND TRANSPORTATION--The student will be able to:

- 15.01 Perform electronic technology laboratory activities.
  - 15.01.01 Define electronic systems.
  - 15.01.02 Conduct electronic systems experiments using input, process, and output.
- 15.02 Perform computer technology laboratory activities.
  - 15.02.01 Define computer technology.
  - 15.02.02 Conduct computer controlled experiments.
- 15.03 Perform special skills unique to communications operations.
  - 15.03.01 Perform basic drafting skills using traditional tools, instruments, and methods.
  - 15.03.02 Perform basic drafting skills using today's technology.
- 15.04 Perform construction technology laboratory activities.
  - 15.04.01 Perform basic construction skills using traditional tools, equipment and methods.
  - 15.04.02 Perform basic construction skills using today's technology, tools, equipment, and methods.
- 15.05 Perform special skills unique to manufacturing technology.
  - 15.05.01 Perform basic production skills using traditional tools, equipment, and methods.
  - 15.05.02 Perform basic production skills using today's technology, tools, equipment, and methods (CAD/CAM, CNC, Robots, Work Cell, etc.).
- 15.06 Perform special skills unique to energy, power, and transportation technology.
  - 15.06.01 Perform basic energy, power, and transportation skills using traditional tools, equipment and methods.

15.06.02 Perform basic energy, power, and transportation skills using today's technology, tools, equipment and methods.

16.0 EXPRESS A KNOWLEDGE OF THE ESSENTIAL ELEMENTS AND ORGANIZATION OF THE FREE ENTERPRISE SYSTEM--The student will be able to:

16.01 Outline the main functions of research and development, personnel management, production, quality control, and marketing.
16.02 Participate in a simulated technology organization incorporating the five above elements.

17.0 LIST REQUISITES AND EMPLOYMENT OPPORTUNITIES FOR EMPLOYMENT IN TODAY'S AND OUR FUTURE TECHNOLOGICAL WORLD--The student will be able to:

17.01 List occupations, job requirements and employment opportunities in communications technology.
17.02 List occupations, job requirements and employment opportunities in construction technology.
17.03 List occupations, job requirements and employment opportunities in manufacturing technology.
17.04 List occupations, job requirements and employment opportunities in energy, power, and transportation technology.
17.05 List related occupations and academic courses available at the secondary and postsecondary levels.

18.0 IDENTIFY KINDS AND LEVELS OF WORK COMMON TO TECHNOLOGY--The student will be able to:

18.01 Identify kinds of work as a technology craftsperson.
18.02 Identify kinds of work as a technology technician.
18.03 Identify kinds of work as a technology engineer or scientist.
18.04 Identify kinds of work in technology management.
18.05 Identify other kinds of technology work.

Program: 8600000 Integrated Technology Studies

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600030
Course Title: Exploration of Communications Technology
Course Credit: 0.5

COURSE DESCRIPTION:

01.0 DEMONSTRATE PROPER AND SAFE PROCEDURES WHILE WORKING WITH TECHNOLOGICAL TOOLS, APPARATUS, EQUIPMENT, SYSTEMS, AND MATERIALS--The student will be able to:

01.01 Follow laboratory safety rules and procedures.
01.02 Demonstrate good housekeeping at work station within total laboratory.
01.03 Conduct laboratory activities and equipment operations in a safe manner.
01.04 Exercise care and respect for all tools, equipment, and materials.
01.05 Identify color-coding safety standards.
01.06 Safely use hand tools and power equipment.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 EXHIBIT POSITIVE HUMAN RELATIONS AND LEADERSHIP SKILLS--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Work cooperatively with others.

03.0 DEMONSTRATE COMPUTER APPLICATION AND LITERACY--The student will be able to:

03.01 Define terms related to computer parts and usage.
03.02 List ways in which computers are used in technology.
03.03 Discuss advantages and disadvantages in the use of computers.
03.04 Demonstrate the application of a computer.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Use the features of books and reference materials, such as table of contents, preface, introduction, titles and subtitles, index, glossary, appendix, bibliography.
04.02 Read and follow complex written directions.
04.03 Find, understand, and apply information from a variety of sources (books, manuals, newspapers, periodicals, directories,

reference works, computer printouts, and other printed matter or electronic sources such as video display terminals.

04.04 Use and expand general and specialized vocabulary (including abbreviations, acronyms, and concepts) As appropriate to subject areas studied at the grade level.

04.05 Write Standard English sentences with correct:
- sentence structure;
- verb forms;
- punctuation, capitalization, possessives, plural forms, and other matters of mechanics;
- word choice and spelling.

04.06 Answer and ask questions coherently and concisely, and follow spoken instructions.

04.07 Identify and comprehend the main and subordinate ideas in lectures and discussions, ask questions to clarify information heard, and report accurately what others have said.

04.08 Perform with accuracy the computations of addition, subtraction, multiplication, and division using natural numbers, fractions, decimals and integers.

04.09 Make and use measurements in both traditional and metric units.

04.10 Formulate and solve problems in mathematical terms, selecting appropriate approaches and tools (mental computation, trial and error, paper-and-pencil techniques, calculator, and computer).

04.11 Solve work-related problems involving the basic arithmetic oper-ations using whole numbers, fractions, decimals, and percents.

04.12 Describe the role of observation and experimentation in the development of scientific theories.

04.13 Gather scientific information through skills in laboratory, field and library work.

04.14 Draw conclusions or make inferences from data.

04.15 Apply basic scientific/technical solutions to the appropriate problems.

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.

05.03 Design and implement the optimal solution to a given problem.

06.0 DEMONSTRATE TECHNOLOGICAL LITERACY--The student will be able to:

06.01 Outline major historical technological developments or events.

06.02 Identify recent advances in technology.

06.03 Explain problem-solving roles of technology.

06.04 Forecast a technological development or event.

06.05 Make a technological decision.

06.06 Define technology.

07.0 DISPLAY AN UNDERSTANDING AND APPRECIATION FOR THE DIGNITY AND WORTH OF HONEST LABOR--The student will be able to:

07.01 Form an understanding and appreciation for work after listening to or observing technology workers.
07.02 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
07.03 Form an understanding and appreciation for the roles and work of co-workers.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

19.0 LIST REQUISITES AND CAREER OPPORTUNITIES FOR EMPLOYMENT IN COMMUNICATIONS TECHNOLOGY--The student will be able to:

19.01 List occupations, job requirements, and employment opportunities in graphic communication technology.
19.02 Identify kinds of work related to various communications occupations.
19.03 List occupational training programs and academic programs at the postsecondary levels in graphic communications technologies.
19.04 Express a knowledge of communications technology labor organizations and hiring practices.
19.05 Identify recent advances in technology and evolving technologies in communications.
19.06 Report on a recent evolving technology in communications.

20.0 PERFORM SPECIAL SKILLS UNIQUE TO COMMUNICATIONS TECHNOLOGY--The student will be able to:

20.01 Identify and use basic drafting tools and instruments for making drawings.
20.02 Explain the processes of relief, gravur, screen process, and lithographic printing; bindery operations; photographic reproduction; and electronic communications.
20.03 Use proper layout and design skills for producing a printed product.
20.04 Produce a product utilizing screen process printing technology and skills.
20.05 Produce a product utilizing lithographic printing technology and skills.
20.06 Produce a print utilizing photographic technology and skills.
20.07 Use bindery skills to produce a book or booklet.
20.08 Apply technical knowledge and skills related to two or more of the following areas of electronic communications: telephone, radio, television, digital data transmission, and satellite communications.

21.0 EXPRESS A KNOWLEDGE OF FACTORS THAT IMPACT ON COMMUNICATIONS TECHNOLOGY AND PRACTICES--The student will be able to:

21.01 Explain economic factors that impact on graphic communications technology.

21.02 Research and identify styles and types of printed products desired by customers or consumers.

21.03 Identify the natural and synthetic resources required for papers, inks, rollers, and solutions used in graphic communications technology.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600040
Course Title: Exploration of Production Technology
Course Credit: 0.5

COURSE DESCRIPTION:

01.0 DEMONSTRATE PROPER AND SAFE PROCEDURES WHILE WORKING WITH TECHNOLOGICAL TOOLS, APPARATUS, EQUIPMENT, SYSTEMS, AND MATERIALS--The student will be able to:

01.01 Follow laboratory safety rules and procedures.
01.02 Demonstrate good housekeeping at work station within total laboratory.
01.03 Conduct laboratory activities and equipment operations in a safe manner.
01.04 Exercise care and respect for all tools, equipment, and materials.
01.05 Identify color-coding safety standards.
01.06 Safely use hand tools and power equipment.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 EXHIBIT POSITIVE HUMAN RELATIONS AND LEADERSHIP SKILLS--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Work cooperatively with others.

03.0 DEMONSTRATE COMPUTER APPLICATION AND LITERACY--The student will be able to:

03.01 Define terms related to computer parts and usage.
03.02 List ways in which computers are used in technology.
03.03 Discuss advantages and disadvantages in the use of computers.
03.04 Demonstrate the application of a computer.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Use the features of books and reference materials, such as table of contents, preface, introduction, titles and subtitles, index, glossary, appendix, bibliography.
04.02 Read and follow complex written directions.
04.03 Find, understand, and apply information from a variety of sources (books, manuals, newspapers, periodicals, directories,

reference works, computer printouts, and other printed matter or electronic sources such as video display terminals.

04.04 Use and expand general and specialized vocabulary (including abbreviations, acronyms, and concepts) As appropriate to subject areas studied at the grade level.

04.05 Write Standard English sentences with correct:
- sentence structure;
- verb forms;
- punctuation, capitalization, possessives, plural forms, and other matters of mechanics;
- word choice and spelling.

04.06 Answer and ask questions coherently and concisely, and follow spoken instructions.

04.07 Identify and comprehend the main and subordinate ideas in lectures and discussions, ask questions to clarify information heard, and report accurately what others have said.

04.08 Perform with accuracy the computations of addition, subtraction, multiplication, and division using natural numbers, fractions, decimals and integers.

04.09 Make and use measurements in both traditional and metric units.

04.10 Formulate and solve problems in mathematical terms, selecting appropriate approaches and tools (mental computation, trial and error, paper-and-pencil techniques, calculator, and computer).

04.11 Solve work-related problems involving the basic arithmetic oper-ations using whole numbers, fractions, decimals, and percents.

04.12 Describe the role of observation and experimentation in the development of scientific theories.

04.13 Gather scientific information through skills in laboratory, field and library work.

04.14 Draw conclusions or make inferences from data.

04.15 Apply basic scientific/technical solutions to the appropriate problems.

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.

05.03 Design and implement the optimal solution to a given problem.

06.0 DEMONSTRATE TECHNOLOGICAL LITERACY--The student will be able to:

06.01 Outline major historical technological developments or events.

06.02 Identify recent advances in technology.

06.03 Explain problem-solving roles of technology.

06.04 Forecast a technological development or event.

06.05 Make a technological decision.

06.06 Define technology.

07.0 DISPLAY AN UNDERSTANDING AND APPRECIATION FOR THE DIGNITY AND WORTH OF HONEST LABOR--The student will be able to:

07.01 Form an understanding and appreciation for work after listening to or observing technology workers.
07.02 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
07.03 Form an understanding and appreciation for the roles and work of co-workers.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

22.0 IDENTIFY EVOLVING TECHNOLOGIES OF PRODUCTIONS SYSTEMS--The student will be able to:

22.01 Participate in a discussion about evolving technologies of manufacturing systems and construction processes.
22.02 List evolving technologies of manufacturing and construction industries.
22.03 Brainstorm futuristic production systems.

23.0 PERFORM SPECIAL SKILLS UNIQUE TO MANUFACTURING TECHNOLOGY--The student will be able to:

23.01 Design a product for custom or mass production manufacturing.
23.02 Plan a mass production system for manufacturing a product.
23.03 Perform materials forming practices such as casting or molding, and compressing or stretching.
23.04 Perform materials separating practices such as shearing, chip removing, and other separating processes.
23.05 Perform materials conditioning practices such as heat treating, physical conditioning, or through chemical reactions.
23.06 Combine components through mixing, coating, bonding, and mechanical fastening.
23.07 Assemble a product or a subassembly of a product.

24.0 EXPRESS A KNOWLEDGE OF FACTORS THAT IMPACT ON MANUFACTURING TECHNOLOGY AND PRACTICES--The student will be able to:

24.01 Explain economic factors that impact on manufacturing technology.
24.02 Research and identify consumer demands for a manufactured product.
24.03 Identify sources of raw materials and/or standard stock materials needed for a manufactured product.
24.04 Interview, hire, train, or promote an applicant or employee for a simulated mass production manufacturing activity.
24.05 Define the terms "organized labor" and "collective bargaining."
24.06 Prepare a plan for marketing and distributing a manufactured product.

25.0 PERFORM SPECIAL SKILLS UNIQUE TO CONSTRUCTION TECHNOLOGY--The student will be able to:

25.01 Interpret construction plans and blueprints.
25.02 Identify construction materials.
25.03 Apply carpentry skills.
25.04 Apply plumbing skills.
25.05 Apply electrical wiring skills.
25.06 Apply masonry skills.
25.07 Describe or demonstrate the construction skills of plastering, roofing and finishing.

26.0 EXPRESS A KNOWLEDGE OF FACTORS THAT IMPACT ON CONSTRUCTION TECHNOLOGY AND PRACTICES--The student will be able to:

26.01 Explain economic factors that impact on construction technology.
26.02 Research and identify types and styles of construction desired by consumers.
26.03 List sources of raw materials and standard stock materials available to construction technology.
26.04 Express a knowledge of construction technology labor organizations and hiring practices.

27.0 IDENTIFY KINDS AND LEVELS OF WORK COMMON TO PRODUCTION TECHNOLOGY--The student will be able to:

27.01 Identify kinds of work related to manufacturing technologies.
27.02 Identify semiskilled, skilled, and professional levels of work in manufacturing construction technology.
27.03 List occupations, job requirements, and employment opportunities in manufacturing technology.
27.04 List occupational training programs and academic programs at the secondary/post secondary levels in manufacturing technologies.
27.05 List occupations, job requirements and employment opportunities in construction technology.
27.06 List occupational training programs and academic programs at the secondary/post secondary levels in construction technologies.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600050
Course Title: Exploration of Aerospace Technology 95-96
Course Credit: 0.5

COURSE DESCRIPTION:

01.0 DEMONSTRATE PROPER AND SAFE PROCEDURES WHILE WORKING WITH TECHNOLOGICAL TOOLS, APPARATUS, EQUIPMENT, SYSTEMS, AND MATERIALS--The student will be able to:

01.01 Follow laboratory safety rules and procedures.
01.02 Demonstrate good housekeeping at work station within total laboratory.
01.03 Conduct laboratory activities and equipment operations in a safe manner.
01.04 Exercise care and respect for all tools, equipment, and materials.
01.05 Identify color-coding safety standards.
01.06 Safely use hand tools and power equipment.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 EXHIBIT POSITIVE HUMAN RELATIONS AND LEADERSHIP SKILLS--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Work cooperatively with others.

03.0 DEMONSTRATE COMPUTER APPLICATION AND LITERACY--The student will be able to:

03.01 Define terms related to computer parts and usage.
03.02 List ways in which computers are used in technology.
03.03 Discuss advantages and disadvantages in the use of computers.
03.04 Demonstrate the application of a computer.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Use the features of books and reference materials, such as table of contents, preface, introduction, titles and subtitles, index, glossary, appendix, bibliography.
04.02 Read and follow complex written directions.
04.03 Find, understand, and apply information from a variety of sources (books, manuals, newspapers, periodicals, directories,

reference works, computer printouts, and other printed matter or electronic sources such as video display terminals.

04.04 Use and expand general and specialized vocabulary (including abbreviations, acronyms, and concepts) As appropriate to subject areas studied at the grade level.

04.05 Write Standard English sentences with correct:
- sentence structure;
- verb forms;
- punctuation, capitalization, possessives, plural forms, and other matters of mechanics;
- word choice and spelling.

04.06 Answer and ask questions coherently and concisely, and follow spoken instructions.

04.07 Identify and comprehend the main and subordinate ideas in lectures and discussions, ask questions to clarify information heard, and report accurately what others have said.

04.08 Perform with accuracy the computations of addition, subtraction, multiplication, and division using natural numbers, fractions, decimals and integers.

04.09 Make and use measurements in both traditional and metric units.

04.10 Formulate and solve problems in mathematical terms, selecting appropriate approaches and tools (mental computation, trial and error, paper-and-pencil techniques, calculator, and computer).

04.11 Solve work-related problems involving the basic arithmetic oper-ations using whole numbers, fractions, decimals, and percents.

04.12 Describe the role of observation and experimentation in the development of scientific theories.

04.13 Gather scientific information through skills in laboratory, field and library work.

04.14 Draw conclusions or make inferences from data.

04.15 Apply basic scientific/technical solutions to the appropriate problems.

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.

05.03 Design and implement the optimal solution to a given problem.

06.0 DEMONSTRATE TECHNOLOGICAL LITERACY--The student will be able to:

06.01 Outline major historical technological developments or events.

06.02 Identify recent advances in technology.

06.03 Explain problem-solving roles of technology.

06.04 Forecast a technological development or event.

06.05 Make a technological decision.

06.06 Define technology.

07.0 DISPLAY AN UNDERSTANDING AND APPRECIATION FOR THE DIGNITY AND WORTH OF HONEST LABOR--The student will be able to:

07.01 Form an understanding and appreciation for work after listening to or observing technology workers.
07.02 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
07.03 Form an understanding and appreciation for the roles and work of co-workers.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

28.0 DEMONSTRATE KNOWLEDGE OF THE BASIC PRINCIPLES OF AEROSTATICS AND AERODYNAMICS--The student will be able to:

28.01 State definitions of terms associated with aerostatics and aerodynamics.
28.02 State the Buoyancy Principle.
28.03 State Bernoulli's Principle.
28.04 Match basic forces acting on an aerodyne in flight to their correct definition.
28.05 State descriptions of the basic parts of a glider.
28.06 State definitions of the components of the cross-sectional shape of an aircraft's wing.
28.07 Build an aerostatic vehicle.
28.08 Build an aerodynamic vehicle.

29.0 IDENTIFY AND DEMONSTRATE KNOWLEDGE OF BOTH LIQUID AND SOLID PROPELLENT ROCKET PROPULSION SYSTEMS--The student will be able to:

29.01 Match terms associated with propulsion systems to their correct definitions.
29.02 State definitions of types of rocket propulsion systems.
29.03 Match parts of a solid-propellant rocket engine to their correct definitions.
29.04 Match parts of a liquid-propellant rocket engine to their correct definitions.
29.05 Discuss the principle of rocket propulsion.
29.06 Label the major units of the Space Shuttle's propulsion systems.
29.07 Identify the major components of the Space Shuttle's main engines.
29.08 Label the major components of the Space Shuttle's external tank.
29.09 Identify the major components of the Space Shuttle's solid-rocket boosters.
29.10 Compare the propulsion systems of solid and liquid-propellant rockets.
29.11 Simulate a multi-stage rocket launch.
29.12 Construct a solid-propellant model rocket.

30.0 DEFINE, DESCRIBE AND DEMONSTRATE COMPOSITE MATERIALS PROCESSING AND USE IN AIRFRAME FABRICATION--The student will be able to:

30.01 Match terms associated with airframe manufacturing to their correct definitions.
30.02 Match components of the manufacturing system model to their correct definitions.

31.0 DEFINE AND DESCRIBE THE STAGES AND FORMS OF INTERFERENCE IN A BASIC OR SATELLITE COMMUNICATION SYSTEMS--The student will be able to:

31.01 State definitions of the terms communication and interference.
31.02 List and define the stages of a basic communication system.
31.03 Describe forms of interference that can occur at various stages in a basic communication system.
31.04 Discuss the importance of feed back in a basic communication system.
31.05 Define parts of the process in a basic communication system.
31.06 Describe the parts of the process in a satellite communication system.
31.07 Describe the parts of the process in a helium-neon laser communication system.
31.08 Use a laser to simulate satellite communications.

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Orientation to Technology
Occupational Area:	Technology Education
	Secondary
Program Numbers	**8600110**
CIP Number	0821.0111OR
Grade Level	6-9, 30, 31
Length	.5 credits
Certification	INDUS ARTS @4 @6
	METALS @4
	I ART-TEC 1 @2
	WOODWORK @4
	GEN SHOP @4

I. **MAJOR CONCEPTS/CONTENT:** The purpose of this course is to orient students to the concepts that underlie technological systems and the influence of technological systems at home, school, and the world of work. Emphasis is placed on the fact that people must develop and control technology responsibly; also, that people have the capabilities to determine how technology can be applied to their benefit. This program focuses on transferable skills and stresses understanding and demonstration of the technological tools, machines, instruments, materials, processes and systems in business and industry.

Laboratory activities revolving around traditional and modern technological tools, machines, and devices will provide students with "design and construct" experiences.
The content includes, but is not limited to, the study of technology with emphasis on its development and control, desirable and undesirable impacts, input-process-output systems model, and possibilities and limitations. Special skills, safety, and leadership are also included.

II. **LABORATORY ACTIVITIES:** Instruction and learning activities are provided in a laboratory setting using hands-on exploratory experiences with the tools and materials related to the content.

III. **SPECIAL NOTE:** The Florida Technology Student Association (FL-TSA)is the appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. Vocational student organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Design code 240 is the appropriate laboratory facility for this course.

IV. **INTENDED OUTCOMES:** After successfully completing this course, the student will be able to:

BEST COPY AVAILABLE

01.0 Demonstrate proper and safe procedures while working with technological tools, apparatus, equipment, systems and materials.
02.0 Exhibit positive human relations and leadership skills.
03.0 Demonstrate computer application and literacy.
04.0 Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05.0 Demonstrate and apply design/problem-solving processes.
06.0 Demonstrate technological literacy.
07.0 Display an understanding and appreciation for the dignity and worth of honest labor.
08.0 Discuss individual interests and aptitudes as they relate to a career.
09.0 Demonstrate the use of technological systems in processing resources.
10.0 Utilize various controls for technological systems.
11.0 Discuss the outputs of technology on society and the environment.
12.0 Select appropriate resources for technological decision making.
13.0 Identify kinds and levels of work common to technology.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Orientation To Technology
Secondary Number: 8600110
Postsecondary Number:

01.0 DEMONSTRATE PROPER AND SAFE PROCEDURES WHILE WORKING WITH TECHNOLOGICAL TOOLS, APPARATUS, EQUIPMENT, SYSTEMS, AND MATERIALS--The student will be able to:

01.01 Follow laboratory safety rules and procedures.
01.02 Demonstrate good housekeeping at work station within total laboratory.
01.03 Conduct laboratory activities and equipment operations in a safe manner.
01.04 Exercise care and respect for all tools, equipment, and materials.
01.05 Identify color-coding safety standards.
01.06 Safely use hand tools and power equipment.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 EXHIBIT POSITIVE HUMAN RELATIONS AND LEADERSHIP SKILLS--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Work cooperatively with others.

03.0 DEMONSTRATE COMPUTER APPLICATION AND LITERACY--The student will be able to:

03.01 Define terms related to computer parts and usage.
03.02 List ways in which computer are used in technology.
03.03 Discuss advantages and disadvantages in the use of computers.
03.04 Demonstrate the application of a computer.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Use the features of books and reference materials, such as table of contents, preface, introduction, titles and subtitles, index, glossary, appendix, bibliography.
04.02 Read and follow complex written directions.
04.03 Find, understand, and apply information from a variety of sources (books, manuals, newspapers, periodicals, directories, reference works, computer printouts, and other printed matter or electronic sources such as video display terminals).

04.04 Use and expand general and specialized vocabulary (including abbreviations, acronyms, and concepts) as appropriate to subject areas studied at the grade level.

04.05 Write Standard English sentences with correct:
- sentence structure;
- verb forms;
- punctuation, capitalization, possessives, plural forms, and other matters of mechanics;
- word choice and spelling.

04.06 Answer and ask questions coherently and concisely, and follow spoken instructions.

04.07 Identify and comprehend the main and subordinate ideas in lectures and discussions, ask questions to clarify information heard, and report accurately what others have said.

04.08 Perform with accuracy the computations of addition, subtraction, multiplication, and division using natural numbers, fractions, decimals and integers.

04.09 Make and use measurements in both traditional and metric units.

04.10 Formulate and solve problems in mathematical terms, selecting appropriate approaches and tools (mental computation, trial and error, paper-and-pencil techniques, calculator, and computer).

04.11 Solve work-related problems involving the basic arithmetic operations using whole numbers, fractions, decimals, and percents.

04.12 Describe the role of observation and experimentation in the development of scientifc theories.

04.13 Gather scientific information through skills in laboratory, field and library work.

04.14 Draw conclusions or make inferences from data.

04.15 Apply basic scientific/technical solutions to the appropriate problems.

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.

05.03 Design and implement the optimal solution to a given problem.

06.0 DEMONSTRATE TECHNOLOGICAL LITERACY--The student will be able to:

06.01 Outline major historical technological developments or events.

06.02 Identify recent advances in technology.

06.03 Explain problem-solving roles of technology.

06.04 Forecast a technological decision.

06.05 Make a technological decision.

06.06 Define technology.

07.0 DISPLAY AN UNDERSTANDING AND APPRECIATION FOR THE DIGNITY AND WORTH OF HONEST LABOR--The student will be able to:

07.01 Form an understanding and appreciation for work after listening to or observing technology workers.

07.02 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.

07.03 Form an understanding and appreciation for the roles and work of co-workers.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE THE USE OF TECHNOLOGICAL SYSTEMS IN PROCESSING RESOURCES--The student will be able to:

09.01 Identify four types of materials conversion.
09.02 Identify the types, sources, and conversions of energy.
09.03 Identify the steps in processing information.
09.04 Construct a product using the materials conversion processes.
09.05 Construct a product that converts energy.
09.06 Use a computer to process information.

10.0 UTILIZE VARIOUS CONTROLS FOR TECHNOLOGICAL SYSTEMS--The student will be able to:

10.01 Identify various control sub-systems.
10.02 Identify components of various control sub-systems.
10.03 Construct sub-system controls.
10.04 Demonstrate the use of sub-system controls.

11.0 DISCUSS THE OUTPUTS OF TECHNOLOGY ON SOCIETY AND THE ENVIRONMENT--The student will be able to:

11.01 Discuss the outputs of technology, now and in the future.
11.02 Discuss the impacts of technology on work, job opportunities, and careers.
11.03 Identify the scope of technological impacts.
11.04 Identify means of controlling the world impacts of technology.
11.05 Discuss how technology can solve and/or create problems.
11.06 Discuss expected and unexpected outputs of technology.
11.07 Discuss desired and undesired outputs of technology.

12.0 SELECT APPROPRIATE RESOURCES FOR TECHNOLOGICAL DECISION MAKING--The student will be able to:

12.01 Identify goals, processes available, constraints and limitations for utilizing the resources.
12.02 Discuss the optimization, compromises and trade-offs for wise use of resources.
12.03 Identify the properties of various materials.
12.04 Select appropriate computer software for graphics and special applications.

13.0 IDENTIFY KINDS AND LEVELS OF WORK COMMON TO TECHNOLOGY--The student will be able to:

13.01 Identify kinds of work related to technology.
13.02 Identify semiskilled, skilled, and professional levels of work in technology.

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Exploration of Graphic Communications Technology
Occupational Area:	Technology Education
	Secondary
Program Numbers	**8600220**
CIP Number	0821.0116EX
Grade Level	6-9, 30, 31
Length	0.5 credits
Certification	INDUS ARTS @4 @6 GRAPH ARTS @4 GEN SHOP @4 PRINTING @4 @7G I ART-TEC 1 @2

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this course is for students to explore the kinds and levels of work performed in graphic communications technology. Laboratory experiences will allow students to explore the occupations, skills, and technologies of graphic communications. This program focuses on transferable skills and stresses understanding and demonstration of the technological tools, machines, instruments, materials, processes and systems in business and industry.

The content includes, but is not limited to, the exploratory study of graphic communications technology, occupations, skills, safety, human relations, and leadership.

II. **LABORATORY ACTIVITIES**: Instruction and learning activities provided in a laboratory setting using hands-on exploratory experiences with the tools and materials appropriate to the course content.

III. **SPECIAL NOTE**: The Florida Technology Student Association (FL-TSA)is the appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. Vocational student organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Design code 240 is the appropriate laboratory facility for this course.

IV. **INTENDED OUTCOMES**: After successfully completing this course, the student will be able to:

01.0 Demonstrate proper and safe procedures while working with technological tools, apparatus, equipment, systems, and materials.
02.0 Exhibit positive human relations and leadership skills.
03.0 Demonstrate computer application and literacy.

BEST COPY AVAILABLE

04.0 Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05.0 Demonstrate and apply design/problem-solving processes.
06.0 Demonstrate technological literacy.
07.0 Display an understanding and appreciation for the dignity and worth of honest labor.
08.0 Discuss individual interests and aptitudes as they relate to a career.
09.0 Identify evolving technologies in graphic communications.
10.0 Perform special skills unique to graphic communications technology.
11.0 Express a knowledge of factors that impact on graphic communications technology and practices.
12.0 List requisites and career opportunities for employment in graphic communications technology.
13.0 Identify kinds and levels of work common to graphic communications technology.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Exploration Of Graphic Communications Technology
Secondary Number: 8600220
Postsecondary Number:

01.0 DEMONSTRATE PROPER AND SAFE PROCEDURES WHILE WORKING WITH TECHNOLOGICAL TOOLS, APPARATUS, EQUIPMENT, SYSTEMS, AND MATERIALS--The student will be able to:

01.01 Follow laboratory safety rules and procedures.
01.02 Demonstrate good housekeeping at work station within total laboratory.
01.03 Conduct laboratory activities and equipment operations in a safe manner.
01.04 Exercise care and respect for all tools, equipment, and materials.
01.05 Identify color-coding safety standards.
01.06 Safely use hand tools and power equipment.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 EXHIBIT POSITIVE HUMAN RELATIONS AND LEADERSHIP SKILLS--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Work cooperatively with others.

03.0 DEMONSTRATE COMPUTER APPLICATION AND LITERACY--The student will be able to:

03.01 Define terms related to computer parts and usage.
03.02 List ways in which computer are used in technology.
03.03 Discuss advantages and disadvantages in the use of computers.
03.04 Demonstrate the application of a computer.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Use the features of books and reference materials, such as table of contents, preface, introduction, titles and subtitles, index, glossary, appendix, bibliography
04.02 Read and follow complex written directions.
04.03 Find, understand, and apply information from a variety of sources (books, manuals, newspapers, periodicals, directories, reference works, computer printouts, and other printed matter or electronic sources such as video display terminals).

04.04 Use and expand general and specialized vocabulary (including abbreviations, acronyms, and concepts) as appropriate to subject areas studied at the grade level.

04.05 Write Standard English sentences with correct:
- sentence structure;
- verb forms;
- punctuation, capitalization, possessives, plural forms, and other matters of mechanics;
- word choice and spelling.

04.06 Answer and ask questions coherently and concisely, and follow spoken instructions.

04.07 Identify and comprehend the main and subordinate ideas in lectures and discussions, ask questions to clarify information heard, and report accurately what others have said.

04.08 Perform with accuracy the computations of addition, subtraction, multiplication, and division using natural numbers, fractions, decimals and integers.

04.09 Make and use measurements in both traditional and metric units.

04.10 Formulate and solve problems in mathematical terms, selecting appropriate approaches and tools (mental computation, trial and error, paper-and-pencil techniques, calculator, and computer).

04.11 Solve work-related problems involving the basic arithmetic operations using whole numbers, fractions, decimals, and percents.

04.12 Describe the role of observation and experimentation in the development of scientifc theories.

04.13 Gather scientific information through skills in laboratory, field and library work.

04.14 Draw conclusions or make inferences from data.

04.15 Apply basic scientific/technical solutions to the appropriate problems.

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.

05.03 Design and implement the optimal solution to a given problem.

06.0 DEMONSTRATE TECHNOLOGICAL LITERACY--The student will be able to:

06.01 Outline major historical technological developments or events.

06.02 Identify recent advances in technology.

06.03 Explain problem-solving roles of technology.

06.04 Forecast a technological decision.

06.05 Make a technological decision.

06.06 Define technology.

07.0 DISPLAY AN UNDERSTANDING AND APPRECIATION FOR THE DIGNITY AND WORTH OF HONEST LABOR--The student will be able to:

07.01 Form an understanding and appreciation for work after listening to or observing technology workers.

07.02 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
07.03 Form an understanding and appreciation for the roles and work of co-workers.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 IDENTIFY EVOLVING TECHNOLOGIES IN GRAPHIC COMMUNICATIONS--The student will be able to:

09.01 List evolving technologies in graphic communications technology.
09.02 Report on a recent evolving technology in graphic communications.

10.0 PERFORM SPECIAL SKILLS UNIQUE TO GRAPHIC COMMUNICATIONS TECHNOLOGY--The student will be able to:

10.01 Identify and use basic drafting tools and instruments for making drawings.
10.02 Use proper layout and design skills for producing a printed product.
10.03 Produce a product utilizing relief printing technology and skills.
10.04 Produce a product utilizing screen process printing technology and skills.
10.05 Produce a product utilizing lithographic printing technology and skills.
10.06 Produce a product utilizing gravure printing technology and skills.
10.07 Produce a print utilizing photographic technology and skills.
10.08 Use bindery skills to produce a book or booklet.

11.0 EXPRESS A KNOWLEDGE OF FACTORS THAT IMPACT ON GRAPHIC COMMUNICATIONS TECHNOLOGY AND PRACTICES--The student will be able to:

11.01 Explain economic factors that impact on graphic communications technology.
11.02 Research and identify styles and types of printed products desired by customers or consumers.
11.03 Identify the natural and synthetic resources required for papers, inks, rollers, and solutions used in graphic communications technology.
11.04 Express a knowledge of graphic communications technology labor organizations and hiring practices.

12.0 LIST REQUISITES AND CAREER OPPORTUNITIES FOR EMPLOYMENT IN GRAPHIC COMMUNICATIONS TECHNOLOGY--The student will be able to:

12.01 List occupations, job requirements, and employment opportunities in graphic communication technology.
12.02 List occupational training programs and academic programs at the postsecondary levels in graphic communications technologies.

13.0 IDENTIFY KINDS AND LEVELS OF WORK COMMON TO GRAPHIC COMMUNICATIONS TECHNOLOGY--The student will be able to:

13.01 Identify kinds of work related to graphic communications technologies.
13.02 Identify semiskilled, skilled, and professional levels of work in graphic communications technology.

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Exploration of Power and Transportation Technology
Occupational Area:	Technology Education
	Secondary
Program Numbers	**8600240**
CIP Number	0821.0115EX
Grade Level	6-9, 30, 31
Length	0.5 credits
Certification	INDUS ARTS @4 @6 TRANSPORT @4 AUTO MECH @7G GEN SHOP @4 GASENG RPR @7G I ART-TEC 1 @2

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this course is for students to explore the kinds and levels of work performed in power and transportation technology. Laboratory experiences will allow student to explore the occupations, skills, and technologies of power and transportation technology. This program focuses on transferable skills and stresses understanding and demonstration of the technological tools, machines, instruments, materials, processes and systems in business and industry.

The content includes, but is not limited to, the exploratory study of power and transportation technology, occupations, skills, safety, human relations, and leadership.

II. **LABORATORY ACTIVITIES**: Instruction and learning activities are provided in a laboratory setting using hands-on exploratory experiences with the tools and materials appropriate to the course content.

III. **SPECIAL NOTE**: The Florida Technology Student Association (FL-TSA)is the appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. Vocational student organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Design code 240 is the appropriate laboratory facility for this course.

IV. **INTENDED OUTCOMES**: After successfully completing this program, the student will be able to:

01.0 Demonstrate proper and safe procedures while working with technological tools, apparatus, equipment, systems, and materials.
02.0 Exhibit positive human relations and leadership skills.

03.0 Demonstrate computer application literacy.

04.0 Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.

05.0 Demonstrate and apply design/problem-solving processes.

06.0 Demonstrate technological literacy.

07.0 Display an understanding and appreciation for the dignity and worth of honest labor.

08.0 Discuss individual interests and aptitudes as they relate to a career.

09.0 Identify evolving technologies in power and transportation industries.

10.0 Perform special skills unique to power and transportation technologies.

11.0 Express a knowledge of the industries that deal with power and transportation technology.

12.0 List requisites and career opportunities for employment in power and transportation technology.

13.0 Identify kinds and levels of work common to the power and transportation technology.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Exploration Of Power And Transportation Technology
Secondary Number: 8600240
Postsecondary Number:

01.0 DEMONSTRATE PROPER AND SAFE PROCEDURES WHILE WORKING WITH TECHNOLOGICAL TOOLS, APPARATUS, EQUIPMENT, SYSTEMS, AND MATERIALS--The student will be able to:

01.01 Follow laboratory safety rules and procedures.
01.02 Demonstrate good housekeeping at work station within total laboratory.
01.03 Conduct laboratory activities and equipment operations in a safe manner.
01.04 Exercise care and respect for all tools, equipment, and materials.
01.05 Identify color-coding safety standards.
01.06 Safely use hand tools and power equipment.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 EXHIBIT POSITIVE HUMAN RELATIONS AND LEADERSHIP SKILLS--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Work cooperatively with others.

03.0 DEMONSTRATE COMPUTER APPLICATION AND LITERACY--The student will be able to:

03.01 Define terms related to computer parts and usage.
03.02 List ways in which computer are used in technology.
03.03 Discuss advantages and disadvantages in the use of computers.
03.04 Demonstrate the application of a computer.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Use the features of books and reference materials, such as table of contents, preface, introduction, titles and subtitles, index, glossary, appendix, bibliography.
04.02 Read and follow complex written directions.
04.03 Find, understand, and apply information from a variety of sources (books, manuals, newspapers, periodicals, directories, reference works, computer printouts, and other printed matter or electronic sources such as video display terminals).

04.04 Use and expand general and specialized vocabulary (including abbreviations, acronyms, and concepts) as appropriate to subject areas studied at the grade level.

04.05 Write Standard English sentences with correct:
- sentence structure;
- verb forms;
- punctuation, capitalization, possessives, plural forms, and other matters of mechanics;
- word choice and spelling.

04.06 Answer and ask questions coherently and concisely, and follow spoken instructions.

04.07 Identify and comprehend the main and subordinate ideas in lectures and discussions, ask questions to clarify information heard, and report accurately what others have said.

04.08 Perform with accuracy the computations of addition, subtraction, multiplication, and division using natural numbers, fractions, decimals and integers.

04.09 Make and use measurements in both traditional and metric units.

04.10 Formulate and solve problems in mathematical terms, selecting appropriate approaches and tools (mental computation, trial and error, paper-and-pencil techniques, calculator, and computer).

04.11 Solve work-related problems involving the basic arithmetic operations using whole numbers, fractions, decimals, and percents.

04.12 Describe the role of observation and experimentation in the development of scientifc theories.

04.13 Gather scientific information through skills in laboratory, field and library work.

04.14 Draw conclusions or make inferences from data.

04.15 Apply basic scientific/technical solutions to the appropriate problems.

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.

05.03 Design and implement the optimal solution to a given problem.

06.0 DEMONSTRATE TECHNOLOGICAL LITERACY--The student will be able to:

06.01 Outline major historical technological developments or events.

06.02 Identify recent advances in technology.

06.03 Explain problem-solving roles of technology.

06.04 Forecast a technological decision.

06.05 Make a technological decision.

06.06 Define technology.

07.0 DISPLAY AN UNDERSTANDING AND APPRECIATION FOR THE DIGNITY AND WORTH OF HONEST LABOR--The student will be able to:

07.01 Form an understanding and appreciation for work after listening to or observing technology workers.

07.02 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
07.03 Form an understanding and appreciation for the roles and work of co-workers.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 IDENTIFY EVOLVING TECHNOLOGIES IN POWER AND TRANSPORTATION INDUSTRIES--The student will be able to:

09.01 List evolving technologies in power technology.
09.02 List evolving technologies in transportation technology.
09.03 Report on a recent evolving technology in power and transportation.

10.0 PERFORM SPECIAL SKILLS UNIQUE TO POWER AND TRANSPORTATION TECHNOLOGIES--The student will be able to:

10.01 Disassemble and reassemble or perform maintenance on a muscle powered bicycle.
10.02 Disassemble and reassemble or perform maintenance on a pneumatic or hydraulic device.
10.03 Disassemble and reassemble or perform maintenance on an internal combustion engine.
10.04 Disassemble and reassemble or perform maintenance on an electrical motor, generator, or alternator.
10.05 Construct, maintain, or repair a land, water, or air/space vehicle.
10.06 Construct a water-powered, wind-powered, steam-powered, thermal-powered, or solar-powered device.

11.0 EXPRESS A KNOWLEDGE OF THE INDUSTRIES THAT DEAL WITH POWER AND TRANSPORTATION TECHNOLOGY--The student will be able to:

11.01 Identify the technologies that supply or control energy sources.
11.02 Identify technologies that produce power systems.
11.03 Describe power and energy applications in transportation technology.
11.04 List transportation systems produced or used by industries.

12.0 LIST REQUISITES AND CAREER OPPORTUNITIES FOR EMPLOYMENT IN POWER AND TRANSPORTATION TECHNOLOGY--The student will be able to:

12.01 List occupations, job requirements, and employment opportunities in power technology.

12.02 List occupations and employment opportunities in transportation technology.

12.03 List occupational training programs and academic programs available at the postsecondary levels in power and in transportation technologies.

13.0 IDENTIFY KINDS AND LEVELS OF WORK COMMON TO POWER AND TRANSPORTATION TECHNOLOGY--The student will be able to:

13.01 Identify kinds of work related to power technologies.

13.02 Identify kinds of work related to transportation technologies.

13.03 Identify semiskilled, skilled, and professional levels of work in power and transportation technology.

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Technology Systems
Occupational Area:	Technology Education
	Secondary
Program Numbers	**8600400**
CIP Number	0821.0128PA
Grade Level	9-12, 30, 31
Length	0.5 credits
Certification	INDUS ARTS @4 @6 I ART-TEC 1 @2

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this program is to provide students with a foundation of knowledge and technically oriented experiences in the study of the applications of technology and its effect upon our lives and the choosing of an occupation. Students will be introduced to the concepts that underlie technological systems and the influence of technological systems at home, school, and the world of work. This program focuses on transferable skills and stresses understanding and demonstration of the technological tolls, machines, instruments, materials, processes and systems in business and industry.

Listed below are the courses that make up this program at the secondary level followed by the laboratory design code appropriate for the courses.

8600410 - Communication Systems (242)
8600420 - Power and Transportation Systems (242)
8600430 - Production Systems (242)
8600440 - Drafting/Illustrative Design Systems (242)
8600450 - Electronics Systems (241)
8600460 - Engineering Systems (242)
8600470 - Applied Technology Systems (242)
8600480 - Home Technology Systems (242)

II. **LABORATORY ACTIVITIES**: Learning activities are provided in a laboratory setting using hands-on experiences with the tools and materials appropriate to the course content.

III. **SPECIAL NOTE**: The Florida Technology Student Association (FL-TSA)is the appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. Vocational student organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

In accordance with HB 2489 - Section 42, approved by the Florida Legislature and signed into law June 16, 1995, Technology Education students who have completed a minimum of three sequential credits in an eligible technology education program by the end of school year 1995-96 and thereafter will be eligible for the Gold Seal designation. The student must also continue in a planned, related post secondary education program.

IV. **INTENDED OUTCOMES**: After successfully completing a course the student will be able to:

01.0 Demonstrate the ability to work safely with a variety of Technologies.
02.0 Demonstrate interpersonal skills as they relate to the workplace.
03.0 Identify and apply methods of information acquisition andutilizations.
04.0 Apply basic skills in communications mathematics, and science appropriate to technological content and learning activities.
05.0 Demonstrate and apply design/problem-solving processes.
06.0 Express an understanding of technology systems and their complex interrelationships.
07.0 Demonstrate the ability to properly identify, organize, plan and allocate resources.
08.0 Demonstrate technological literacy about communications systems.
09.0 Apply communications technology skills.
10.0 Describe sources of energy.
11.0 Describe the application of energy to power and transportation systems.
12.0 Apply technology skills to a selected power or transportation system.
13.0 Demonstrate a knowledge of the production systems found in modern industries.
14.0 Define the processes related to materials utilized in manufacturing and production.
15.0 Plan and develop a system to produce a product from available materials.
16.0 Demonstrate proper and safe procedures and technical knowledge and skills in the use and care of drafting instruments, materials equipment.
17.0 Demonstrate technical knowledge skills and applications common to all types of drafting including CAD.
18.0 Demonstrate technical knowledge and skills for making drafting sketches.
19.0 Demonstrate technical knowledge and skills for making three-view orthographic drawings.
20.0 Demonstrate technical knowledge and skills for making oblique pictorial drawings.
21.0 Demonstrate technical knowledge and skills for making isometric pictorial drawings.
22.0 Demonstrate technical knowledge and skills for making aerodynamic drawings.
23.0 Demonstrate technical knowledge and skills for making a CAD drawing.
24.0 Demonstrate technical knowledge and skills for reproducing a CAD drawing on a plotter.

25.0 Apply electricity/electronics technology skills.

26.0 Demonstrate technological literacy about electricity/electronics systems.

27.0 Demonstrate knowledge of the role electronics plays in magnetic, optical, fluid and mechanical control systems.

28.0 Demonstrate the engineering analysis and design methods.

29.0 Communicate through oral, written or graphic means the results of solutions or designs.

30.0 Demonstrate and apply mechanical, fluid, electrical and thermal system principles.

31.0 Demonstrate a knowledge of materials and processes.

32.0 Use tools, machines, calculators, and computers necessary for obtaining solutions to design problems.

33.0 Describe the functional characteristics of the engineering design team.

34.0 Discuss the impact of technology on society and the environment.

35.0 Demonstrate and apply mechanical system principles.

36.0 Demonstrate and apply fluid system principles.

37.0 Demonstrate and apply electrical system principles.

38.0 Demonstrate and apply thermal system principles.

39.0 Demonstrate the use of a computer to integrate and control a system composed of mechanical, fluid and electrical systems.

40.0 Demonstrate the use of sensors to control systems.

41.0 Demonstrate the use of fiber optics concepts.

42.0 Demonstrate the use of laser optic concepts.

43.0 Identify and list the different systems found in the new homes under construction today.

44.0 Draw up a bill of materials required to repair a selected component of a unit in a home technology system.

45.0 Apply home maintenance technology skills to a selected system requiring repair.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Technology Systems
Secondary Number: 8600400
Postsecondary Number:

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work state and within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evaluation.
03.03 Discuss advantages and disadvantages in the application of technologies.

03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.

03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.

04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.

04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.

04.04 Distinguish fact from opinion.

04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.

04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.

04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.

04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.

04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.

04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.

04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.

04.14 Use the mathematics of:
- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.

04.16 Use elementary concepts of probability and statistics.

04.17 Draw, read, and analyze graphs, charts, and tables.

04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.

04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry: (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, orgainzational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DEMONSTRATE TECHNOLOGICAL LITERACY ABOUT COMMUNICATIONS SYSTEMS--The student will be able to:

08.01 Define communications technology.

08.02 Outline major technological developments and events in the history of communications systems technology.
08.03 Identify recent advances in communications technology.
08.04 Forecast a development or event in communications technology.

09.0 APPLY COMMUNICATIONS TECHNOLOGY SKILLS--The student will be able to:

09.01 Explain the processes of relief, gravure, screen process, and lithographic printing; bindery operations; photographic reproduction; and electronic communications.
09.02 Demonstrate technical knowledge and skills in the preparation of art and copy for printing reproduction.
09.03 Design, lay out, and produce a printed product utilizing the above printing processes.
09.04 Express a knowledge of the basic theory of photography.
09.05 Produce a photographic negative and print utilizing the tools, equipment, materials, and processes of photography.
09.06 Describe the basic characteristics and specifications of paper, ink, and chemicals used in communications technology.
09.07 List ways in which computers are used in communications systems technology.
09.08 Operate a computer utilizing a program related to communications technology.
09.09 Express a technical knowledge and understanding about electronic communications technology, to include telephone, radio, television, digital data transmission, and satellite communications.
09.10 Apply technical knowledge and skills related to one or more of the above areas of electronic communications.

10.0 DESCRIBE SOURCES OF ENERGY--The student will be able to:

10.01 Describe sources of thermal energy.
10.02 Describe sources of radiant energy.
10.03 Describe sources of nuclear energy.
10.04 Describe sources of chemical energy.
10.05 Describe sources of electrical energy.
10.06 Describe sources of mechanical energy.
10.07 Describe sources of fluid energy.

11.0 DESCRIBE THE APPLICATIONS OF ENERGY TO POWER AND TRANSPORTATION SYSTEMS--The student will be able to:

11.01 Explain the uses and applications of thermal energy in generating electrical power.
11.02 Discuss how radiant energy is used in our homes.
11.03 Describe energy and fuel sources for internal combustion engines.
11.04 Identify and define key terms, categories and parts of jet engine power systems.
11.05 Identify and explain the uses of hydraulic power in automotive systems.
11.06 List the kinds of exhaustible, renewable, and inexhaustible energy resources.

BEST COPY AVAILABLE

12.0 APPLY TECHNOLOGICAL KNOWLEDGE AND SKILLS TO A SELECTED POWER OR TRANSPORTATION SYSTEM--The student will be able to:

12.01 Identify a system.
12.02 Identify an energy source to be used.
12.03 Plan the procedures for designing the system.
12.04 Sketch and present the plan to the class.

13.0 DEMONSTRATE A KNOWLEDGE OF THE PRODUCTION SYSTEMS FOUND IN MODERN INDUSTRIES--The student will be able to:

13.01 List and describe the three major types of production activities.
13.02 Describe resource processing systems.
13.03 Describe product manufacturing systems.
13.04 Describe structure construction systems.
13.05 Identify recent technological advances in production systems.

14.0 DEFINE THE PROCESSES RELATED TO MATERIALS UTILIZED IN MANUFACTURING AND PRODUCTION--The student will be able to:

14.01 Define manufacturing.
14.02 List and describe six types of secondary manufacturing processes.
14.03 List ways in which computers are used in the manufacturing and production systems.

15.0 PLAN AND DEVELOP A SYSTEM TO PRODUCE A PRODUCT FROM AVAILABLE MATERIALS--The student will be able to:

15.01 Sketch, draw and interpret working drawings.
15.02 Use measuring tools and instruments.
15.03 Design and construct one or more individual projects utilizing technical skills and processes of woods, metals and plastics technology.
15.04 Estimate the cost of the job required to produce the project.
15.05 List groups or organizations that represent specialized manufacturing and production skills.

16.0 DEMONSTRATE PROPER AND SAFE PROCEDURES AND TECHNICAL KNOWLEDGE AND SKILLS IN THE USE AND CARE OF DRAFTING INSTRUMENTS, MATERIALS AND EQUIPMENT--The student will be able to:

16.01 Identify the basic tools and instruments for drafting.
16.02 Interpret a blueprint, working drawing or other type of dimensional technical illustration.
16.03 Produce a working drawing or technical illustration using drafting tools instruments and skills.

17.0 DEMONSTRATE TECHNICAL KNOWLEDGE, SKILLS AND APPLICATIONS COMMON TO ALL TYPES OF DRAFTING INCLUDING COMPUTER-AIDED DRAFTING (CAD)--The student will be able to:

17.01 Outline major technological developments in the history of drafting and design tools and equipment.
17.02 Make freehand sketches.
17.03 Produce a drawing using drafting instruments.
17.04 Set up a computer to produce a drawing.

18.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING DRAFTING SKETCHES--The student will be able to:

18.01 Illustrate a technical idea by means of a sketch.

19.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING ORTHOGRAPHIC DRAWINGS--The student will be able to:

19.01 Explain the theory of orthographic projections.
19.02 Identify the six principal views of an object.
19.03 Produce a three-view orthographic drawing.

20.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING OBLIQUE PICTORIAL DRAWINGS--The student will be able to:

20.01 Define types of pictorial drawings.
20.02 Produce an oblique pictorial drawing.

21.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING ISOMETRIC PICTORIAL DRAWINGS--The student will be able to:

21.01 Discuss the isometric drawing procedures.
21.02 Produce an isometric pictorial drawing.

22.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING AERODYNAMIC DRAWINGS--The student will be able to:

22.01 Discuss aerodynamic designs of aircraft and automobiles.
22.02 Produce an aerodynamic scale drawing.

23.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING A COMPUTER-AIDED DRAWING (CAD)--The student will be able to:

23.01 List the major components of a computer-aided drafting system and their functions.
23.02 Demonstrate technical knowledge and skills in setting up a CAD system.

24.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR REPRODUCING A COMPUTER-AIDED DRAWING ON A PLOTTER--The student will be able to:

24.01 Produce a computer-aided drawing which can be displayed by means of a computer.

25.0 APPLY ELECTRICITY/ELECTRONICS TECHNOLOGY SKILLS--The student will be able to:

25.01 Identify and use the basic tools used in electricity/electronics.
25.02 Identify and use the basic instruments used in electricity/electronics.
25.03 Interpret electricity/electronics wiring diagrams and schematics.
25.04 Identify electricity/electronics components.
25.05 Explain the use of electricity/electronics components.
25.06 Explain the difference between electricity and electronics.
25.07 Describe and construct the following electricity circuits: switch controlled lampholder, three-way switch, four-way switch, splitwired receptacle, door buzzers, thermostat, timer, dimmer, photocell, and fluorescent lamp.

26.0 DEMONSTRATE TECHNOLOGICAL LITERACY ABOUT ELECTRICITY/ELECTRONICS SYSTEMS--The student will be able to:

26.01 Outline major technological developments and events in the history of electricity/electronics.
26.02 Identify recent advances in electricity/electronics.
26.03 Explain the problem-solving roles of electricity/electronics.
26.04 Forecast a development or event in electricity/electronics technology.
26.05 Make a technical decision related to electricity/electronics.
26.06 Define electricity/electronics technology.
26.07 Define solid state, analog and digital systems.
26.08 Explain the basic components of electrical/electronics systems.

27.0 DEMONSTRATE KNOWLEDGE OF THE ROLE ELECTRONICS PLAYS IN MAGNETIC, OPTICAL, FLUID AND MECHANICAL CONTROL SYSTEMS--The student will be able to:

27.01 Identify examples of each type of control system.
27.02 Explain the role electronics plays in systems feedback giving examples of everyday use.
27.03 Identify by brainstorming new possible applications of control systems to satisfy a need or extend human capabilities.

28.0 DEMONSTRATE ENGINEERING ANALYSIS AND DESIGN METHODS--The student will be to:

28.01 Define the terms: analysis, design, and applications.
28.02 Define the experimental method as it is applied to design.
28.03 Describe a design methodology.
28.04 Describe simulation.
28.05 Prepare a model of a design solution to an engineering problem.
28.06 Prepare a graphical solution to an engineering problem.
28.07 Prepare a mathematical solution to an engineering problem (using either a calculator or computer).

29.0 COMMUNICATE THROUGH ORAL WRITTEN, OR GRAPHIC MEANS, THE RESULTS OF SOLUTIONS OR DESIGNS--The student will be able to:

29.01 Understand and interpret basic engineering drawings.

29.02 Measure quantities and conduct basic tests according to published procedures.

29.03 Use precision measuring tools and instruments to layout, measure and inspect parts or articles.

29.04 Sketch objects using multi-view and pictorial principles.

29.05 Prepare drawings using basic technical drawing instruments for orthographic and isometric projections.

29.06 Use engineering design graphics and descriptive geometry in the solution of design problems.

29.07 Describe graphic communications principles.

30.0 DEMONSTRATE AND APPLY MECHANICAL, FLUID, ELECTRICAL AND THERMAL SYSTEM PRINCIPLES--The student will be able to:

30.01 Assemble, operate, and identify the parts of a system which demonstrates mechanical systems principles.

30.02 Assemble, operate, and identify the parts of a system which demonstrates fluid system principles.

30.03 Assemble, operate, and identify the parts of a system which demonstrates electrical system principles.

30.04 Assemble, operate, and identify the parts of a system which demonstrates thermal system principles.

31.0 DEMONSTRATE A KNOWLEDGE OF MATERIALS AND PROCESSES--The student will be able to:

31.01 Describe the physical and chemical properties of engineering materials in terms of their structure.

31.02 List the causes of failure in materials and give procedures to prevent such failure.

31.03 Experiment with processes used with metal, woods, polymers, composite materials and adhesives.

32.0 USE TOOLS, MACHINES, CALCULATORS, AND COMPUTERS NECESSARY FOR OBTAINING SOLUTIONS TO DESIGN PROBLEMS--The student will be able to:

32.01 Demonstrate the use of various graphs to categorize and display data.

32.02 Make decisions using graphical data presentations.

32.03 Demonstrate the use of a nomograph in solving equations.

32.04 Use a numerical calculator to solve complex equations either by direct solution or iteration (trial and error).

32.05 Use a computer and applications software to solve a design problem by simulation.

32.06 Demonstrate graphical vector analysis.

33.0 DESCRIBE THE FUNCTIONAL CHARACTERISTICS OF THE ENGINEERING DESIGN TEAM--The student will be able to:

33.01 Describe work breakdown organization.

33.02 Describe work group organization schemes including functional and hierarchical schemes.

33.03 Describe the function of management in general and project management in particular.

33.04 Describe a typical design project team structure.
33.05 Outline a research methodology.
33.06 Describe brain-storming.

34.0 DISCUSS THE IMPACT OF TECHNOLOGY ON SOCIETY AND THE ENVIRONMENT--The student will be able to:

34.01 Discuss the impact of technology, now and in the future.
34.02 Discuss the impacts of technology on work, job opportunities and careers.
34.03 Identify the scope of technological impacts.
34.04 Identify means of controlling the world impacts of technology.
34.06 Discuss expected and unexpected impacts of technology.
34.07 Discuss desired and undesired impacts of technology.
34.08 Prepare a report on the impact of technology.

35.0 DEMONSTRATE AND APPLY MECHANICAL SYSTEM PRINCIPLES--The student will be able to:

35.01 Assemble, operate, and identify the parts of a system which demonstrates mechanical system principles.
35.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to mechanical systems.

36.0 DEMONSTRATE AND APPLY FLUID SYSTEM PRINCIPLES--The student will be able to:

36.01 Assemble, operate and identify the parts of a system which demonstrates fluid system principles.
36.02 Demonstrate and apply principle of force, work, rate, resistance, energy, power, and force transformers, relating to fluid systems.

37.0 DEMONSTRATE AND APPLY ELECTRICAL SYSTEM PRINCIPLES--The student will be able to:

37.01 Assemble, operate, and identify the parts of a system which demonstrates electrical system principles.
37.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to electrical systems.

38.0 DEMONSTRATE AND APPLY THERMAL SYSTEM PRINCIPLES--The student will be able to:

38.01 Assemble, operate, and identify the parts of a system which demonstrates thermal system principles.
38.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to thermal systems.

39.0 DEMONSTRATE THE USE OF A COMPUTER TO INTEGRATE AND CONTROL A SYSTEM COMPOSED OF MECHANICAL, FLUID AND ELECTRICAL SYSTEMS--The student will be able to:

- 39.01 Diagram an integrated system incorporating input, monitoring, controlling, output and feedback components.
- 39.02 Perform experiments using mechanical, fluid and electrical components in an integrated system.
- 39.03 Assemble, operate and identify the parts of computer controlled mechanical, fluid, and electrical systems.

40.0 DEMONSTRATE THE USE OF SENSORS TO CONTROL SYSTEMS--The student will be able to:

- 40.01 Perform experiments using electronic sensors.
- 40.02 Assemble, operate and identify the types of sensors used in technology.
- 40.03 Write a report on the applications of sensors use in technology.

41.0 DEMONSTRATE THE USE OF FIBER OPTICS CONCEPTS--The student will be able to:

- 41.01 Write a report on the application of fiber optics used in technology.
- 41.02 Perform fiber optics experiments.
- 41.03 Assemble, operate and identify the parts of a fiber optics system.

42.0 DEMONSTRATE THE USE OF LASER OPTICS CONCEPTS--The student will be able to:

- 42.01 Write a report on the applications of laser optics used in technology.
- 42.02 Perform laser optics experiments.
- 42.03 Assemble, operate and identify the parts of a laser optics system.

43.0 IDENTIFY AND LIST THE DIFFERENT SYSTEMS FOUND IN NEW HOMES UNDER CONSTRUCTION TODAY--The student will be able to:

- 43.01 Identify systems used and install in home construction.
- 43.02 Develop a schedule of routine home system preventative maintenance.
- 43.03 Identify recent advances in home maintenance technology.

44.0 DRAW UP A BILL OF MATERIALS REQUIRED TO REPAIR A SELECTED COMPONENT IN A HOME TECHNOLOGY SYSTEM--The student will be able to:

- 44.01 Identify a system component requiring repair.
- 44.02 Identify the problem and parts required to make repairs.
- 44.03 Estimate the cost of repair.

45.0 APPLY HOME MAINTENANCE TECHNOLOGY SKILLS TO A SELECTED SYSTEM REQUIRING REPAIR--The student will be able to:

45.01 Identify and assemble the tools required to perform the repair.

45.02 Demonstrate a knowledge of problem-solving approaches to handle home maintenance needs.

45.03 Demonstrate consumer technical knowledge about home maintenance tools, materials and equipment.

45.04 List ways in which a personal computer may be used for home maintenance purposes.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600410
Course Title: Communication Systems
Course Credit: 0.5

COURSE DESCRIPTION:

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work state and within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evaluation.

03.03 Discuss advantages and disadvantages in the application of technologies.

03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.

03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.

04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.

04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.

04.04 Distinguish fact from opinion.

04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.

04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.

04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.

04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.

04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.

04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.

04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.

04.14 Use the mathematics of:

- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.

04.16 Use elementary concepts of probability and statistics.

04.17 Draw, read, and analyze graphs, charts, and tables.

BEST COPY AVAILABLE

04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.

04.19 Organize and communicate the results obtained by observation and experimentation.

04.20 Apply the basic principles of biology, physics, and chemistry: (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).

04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.

05.03 Design and implement the optimal solution to a given problem.

05.04 Document each step of the design/problem-solving process.

05.05 Demonstrate "brainstorming" as a process to solve problems.

05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, orgainzational, and technological systems work.

06.02 Explore methods used to monitor and correct performance of technological systems.

06.03 Design and implement an optimal solution to a given problem.

06.04 Outline major historical technological developments or events.

06.05 Identify recent advances in technology.

06.06 Explain problem-solving roles of technology.

06.07 Forecast a technological development or event.

06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.

07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.

07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.

07.04 Display a knowledge of the efficient use of human resources.

08.0 DEMONSTRATE TECHNOLOGICAL LITERACY ABOUT COMMUNICATIONS SYSTEMS--The student will be able to:

08.01 Define communications technology.

08.02 Outline major technological developments and events in the history of communications systems technology.

08.03 Identify recent advances in communications technology.

08.04 Forecast a development or event in communications technology.

09.0 APPLY COMMUNICATIONS TECHNOLOGY SKILLS--The student will be able to:

09.01 Explain the processes of relief, gravure, screen process, and lithographic printing; bindery operations; photographic reproduction; and electronic communications.

09.02 Demonstrate technical knowledge and skills in the preparation of art and copy for printing reproduction.

09.03 Design, lay out, and produce a printed product utilizing the above printing processes.

09.04 Express a knowledge of the basic theory of photography.

09.05 Produce a photographic negative and print utilizing the tools, equipment, materials, and processes of photography.

09.06 Describe the basic characteristics and specifications of paper, ink, and chemicals used in communications technology.

09.07 List ways in which computers are used in communications systems technology.

09.08 Operate a computer utilizing a program related to communications technology.

09.09 Express a technical knowledge and understanding about electronic communications technology, to include telephone, radio, television, digital data transmission, and satellite communications.

09.10 Apply technical knowledge and skills related to one or more of the above areas of electronic communications.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600420
Course Title: Power and Transportation Systems
Course Credit: 0.5

COURSE DESCRIPTION:

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work state and within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evaluation.

03.03 Discuss advantages and disadvantages in the application of technologies.

03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.

03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.

04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.

04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.

04.04 Distinguish fact from opinion.

04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.

04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.

04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.

04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.

04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.

04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.

04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.

04.14 Use the mathematics of:
- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.

04.16 Use elementary concepts of probability and statistics.

04.17 Draw, read, and analyze graphs, charts, and tables.

04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry: (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, orgainzational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

10.0 DESCRIBE SOURCES OF ENERGY--The student will be able to:

10.01 Describe sources of thermal energy.

10.02 Describe sources of radiant energy.
10.03 Describe sources of nuclear energy.
10.04 Describe sources of chemical energy.
10.05 Describe sources of electrical energy.
10.06 Describe sources of mechanical energy.
10.07 Describe sources of fluid energy.

11.0 DESCRIBE THE APPLICATIONS OF ENERGY TO POWER AND TRANSPORTATION SYSTEMS--The student will be able to:

11.01 Explain the uses and applications of thermal energy in generating electrical power.
11.02 Discuss how radiant energy is used in our homes.
11.03 Describe energy and fuel sources for internal combustion engines.
11.04 Identify and define key terms, categories and parts of jet engine power systems.
11.05 Identify and explain the uses of hydraulic power in automotive systems.
11.06 List the kinds of exhaustible, renewable, and inexhaustible energy resources.

12.0 APPLY TECHNOLOGICAL KNOWLEDGE AND SKILLS TO A SELECTED POWER OR TRANSPORTATION SYSTEM--The student will be able to:

12.01 Identify a system.
12.02 Identify an energy source to be used.
12.03 Plan the procedures for designing the system.
12.04 Sketch and present the plan to the class.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600430
Course Title: Production Systems
Course Credit: 0.5

COURSE DESCRIPTION:

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work state and within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evaluation.

03.03 Discuss advantages and disadvantages in the application of technologies.

03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.

03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.

04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.

04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.

04.04 Distinguish fact from opinion.

04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.

04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.

04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.

04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.

04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.

04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.

04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.

04.14 Use the mathematics of:

- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.

04.16 Use elementary concepts of probability and statistics.

04.17 Draw, read, and analyze graphs, charts, and tables.

BEST COPY AVAILABLE

04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry: (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, orgainzational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

13.0 DEMONSTRATE A KNOWLEDGE OF THE PRODUCTION SYSTEMS FOUND IN MODERN INDUSTRIES--The student will be able to:

BEST COPY AVAILABLE

13.01 List and describe the three major types of production activities.
13.02 Describe resource processing systems.
13.03 Describe product manufacturing systems.
13.04 Describe structure construction systems.
13.05 Identify recent technological advances in production systems.

14.0 DEFINE THE PROCESSES RELATED TO MATERIALS UTILIZED IN MANUFACTURING AND PRODUCTION--The student will be able to:

14.01 Define manufacturing.
14.02 List and describe six types of secondary manufacturing processes.
14.03 List ways in which computers are used in the manufacturing and production systems.

15.0 PLAN AND DEVELOP A SYSTEM TO PRODUCE A PRODUCT FROM AVAILABLE MATERIALS--The student will be able to:

15.01 Sketch, draw and interpret working drawings.
15.02 Use measuring tools and instruments.
15.03 Design and construct one or more individual projects utilizing technical skills and processes of woods, metals and plastics technology.
15.04 Estimate the cost of the job required to produce the project.
15.05 List groups or organizations that represent specialized manufacturing and production skills.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600440
Course Title: Drafting/Illustrative Design Systems
Course Credit: 0.5

COURSE DESCRIPTION:

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work state and within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evaluation.

03.03 Discuss advantages and disadvantages in the application of technologies.

03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.

03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.

04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.

04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.

04.04 Distinguish fact from opinion.

04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.

04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.

04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.

04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.

04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.

04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.

04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.

04.14 Use the mathematics of:
- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.

04.16 Use elementary concepts of probability and statistics.

04.17 Draw, read, and analyze graphs, charts, and tables.

04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry: (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, orgainzational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

16.0 DEMONSTRATE PROPER AND SAFE PROCEDURES AND TECHNICAL KNOWLEDGE AND SKILLS IN THE USE AND CARE OF DRAFTING INSTRUMENTS, MATERIALS AND EQUIPMENT--The student will be able to:

16.01 Identify the basic tools and instruments for drafting.
16.02 Interpret a blueprint, working drawing or other type of dimensional technical illustration.
16.03 Produce a working drawing or technical illustration using drafting tools instruments and skills.

17.0 DEMONSTRATE TECHNICAL KNOWLEDGE, SKILLS AND APPLICATIONS COMMON TO ALL TYPES OF DRAFTING INCLUDING COMPUTER-AIDED DRAFTING (CAD)--The student will be able to:

17.01 Outline major technological developments in the history of drafting and design tools and equipment.
17.02 Make freehand sketches.
17.03 Produce a drawing using drafting instruments.
17.04 Set up a computer to produce a drawing.

18.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING DRAFTING SKETCHES--The student will be able to:

18.01 Illustrate a technical idea by means of a sketch.

19.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING ORTHOGRAPHIC DRAWINGS--The student will be able to:

19.01 Explain the theory of orthographic projections.
19.02 Identify the six principal views of an object.
19.03 Produce a three-view orthographic drawing.

20.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING OBLIQUE PICTORIAL DRAWINGS--The student will be able to:

20.01 Define types of pictorial drawings.
20.02 Produce an oblique pictorial drawing.

21.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING ISOMETRIC PICTORIAL DRAWINGS--The student will be able to:

21.01 Discuss the isometric drawing procedures.
21.02 Produce an isometric pictorial drawing.

22.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING AERODYNAMIC DRAWINGS--The student will be able to:

22.01 Discuss aerodynamic designs of aircraft and automobiles.
22.02 Produce an aerodynamic scale drawing.

23.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING A COMPUTER-AIDED DRAWING (CAD)--The student will be able to:

23.01 List the major components of a computer-aided drafting system and their functions.
23.02 Demonstrate technical knowledge and skills in setting up a CAD system.

24.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR REPRODUCING A COMPUTER-AIDED DRAWING ON A PLOTTER--The student will be able to:

24.01 Produce a computer-aided drawing which can be displayed by means of a computer.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600450
Course Title: Electronics Systems
Course Credit: 0.5

COURSE DESCRIPTION:

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work state and within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evaluation.

03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  - integers, fractions, and decimals;
  - ratios, proportions, and percentages;
  - roots and powers;
  - algebra;
  - geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.

04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry: (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, orgainzational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

25.0 APPLY ELECTRICITY/ELECTRONICS TECHNOLOGY SKILLS--The student will be able to:

25.01 Identify and use the basic tools used in electricity/electronics.
25.02 Identify and use the basic instruments used in electricity/electronics.
25.03 Interpret electricity/electronics wiring diagrams and schematics.
25.04 Identify electricity/electronics components.
25.05 Explain the use of electricity/electronics components.
25.06 Explain the difference between electricity and electronics.
25.07 Describe and construct the following electricity circuits: switch controlled lampholder, three-way switch, four-way switch, splitwired receptacle, door buzzers, thermostat, timer, dimmer, photocell, and fluorescent lamp.

26.0 DEMONSTRATE TECHNOLOGICAL LITERACY ABOUT ELECTRICITY/ELECTRONICS SYSTEMS--The student will be able to:

26.01 Outline major technological developments and events in the history of electricity/electronics.
26.02 Identify recent advances in electricity/electronics.
26.03 Explain the problem-solving roles of electricity/electronics.
26.04 Forecast a development or event in electricity/electronics technology.
26.05 Make a technical decision related to electricity/electronics.
26.06 Define electricity/electronics technology.
26.07 Define solid state, analog and digital systems.
26.08 Explain the basic components of electrical/electronics systems.

27.0 DEMONSTRATE KNOWLEDGE OF THE ROLE ELECTRONICS PLAYS IN MAGNETIC, OPTICAL, FLUID AND MECHANICAL CONTROL SYSTEMS--The student will be able to:

27.01 Identify examples of each type of control system.
27.02 Explain the role electronics plays in systems feedback giving examples of everyday use.
27.03 Identify by brainstorming new possible applications of control systems to satisfy a need or extend human capabilities.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600460
Course Title: Engineering Systems
Course Credit: 0.5

COURSE DESCRIPTION:

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

- 01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
- 01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
- 01.03 Demonstrate knowledge required to maintain and troubleshoot.
- 01.04 Follow laboratory safety rules and procedures.
- 01.05 Demonstrate good housekeeping at work state and within total laboratory.
- 01.06 Identify color-coding safety standards.
- 01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
- 01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

- 02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
- 02.02 Participate as a member of a team.
- 02.03 Teach others new skills.
- 02.04 Identify skills needed to serve clients/customers.
- 02.05 Demonstrate leadership skills.
- 02.06 Describe strategies necessary for negotiating agreements.
- 02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
- 02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
- 02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
- 02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

- 03.01 Define terms related to computers.
- 03.02 Identify and describe methods of information acquisition and evaluation.

03.03 Discuss advantages and disadvantages in the application of technologies.

03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.

03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.

04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.

04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.

04.04 Distinguish fact from opinion.

04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.

04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.

04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.

04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.

04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.

04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.

04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.

04.14 Use the mathematics of:

  - integers, fractions, and decimals;
  - ratios, proportions, and percentages;
  - roots and powers;
  - algebra;
  - geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.

04.16 Use elementary concepts of probability and statistics.

04.17 Draw, read, and analyze graphs, charts, and tables.

04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry: (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, orgainzational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

28.0 DEMONSTRATE ENGINEERING ANALYSIS AND DESIGN METHODS--The student will be to:

28.01 Define the terms: analysis, design, and applications.
28.02 Define the experimental method as it is applied to design.
28.03 Describe a design methodology.
28.04 Describe simulation.
28.05 Prepare a model of a design solution to an engineering problem.
28.06 Prepare a graphical solution to an engineering problem.
28.07 Prepare a mathematical solution to an engineering problem (using either a calculator or computer).

29.0 COMMUNICATE THROUGH ORAL WRITTEN, OR GRAPHIC MEANS, THE RESULTS OF SOLUTIONS OR DESIGNS--The student will be able to:

29.01 Understand and interpret basic engineering drawings.
29.02 Measure quantities and conduct basic tests according to published procedures.
29.03 Use precision measuring tools and instruments to layout, measure and inspect parts or articles.
29.04 Sketch objects using multi-view and pictorial principles.
29.05 Prepare drawings using basic technical drawing instruments for orthographic and isometric projections.
29.06 Use engineering design graphics and descriptive geometry in the solution of design problems.
29.07 Describe graphic communications principles.

30.0 DEMONSTRATE AND APPLY MECHANICAL, FLUID, ELECTRICAL AND THERMAL SYSTEM PRINCIPLES--The student will be able to:

30.01 Assemble, operate, and identify the parts of a system which demonstrates mechanical systems principles.
30.02 Assemble, operate, and identify the parts of a system which demonstrates fluid system principles.
30.03 Assemble, operate, and identify the parts of a system which demonstrates electrical system principles.
30.04 Assemble, operate, and identify the parts of a system which demonstrates thermal system principles.

31.0 DEMONSTRATE A KNOWLEDGE OF MATERIALS AND PROCESSES--The student will be able to:

31.01 Describe the physical and chemical properties of engineering materials in terms of their structure.
31.02 List the causes of failure in materials and give procedures to prevent such failure.
31.03 Experiment with processes used with metal, woods, polymers, composite materials and adhesives.

32.0 USE TOOLS, MACHINES, CALCULATORS, AND COMPUTERS NECESSARY FOR OBTAINING SOLUTIONS TO DESIGN PROBLEMS--The student will be able to:

32.01 Demonstrate the use of various graphs to categorize and display data.
32.02 Make decisions using graphical data presentations.
32.03 Demonstrate the use of a nomograph in solving equations.

BEST COPY AVAILABLE

32.04 Use a numerical calculator to solve complex equations either by direct solution or iteration (trial and error).
32.05 Use a computer and applications software to solve a design problem by simulation.
32.06 Demonstrate graphical vector analysis.

33.0 DESCRIBE THE FUNCTIONAL CHARACTERISTICS OF THE ENGINEERING DESIGN TEAM--The student will be able to:

33.01 Describe work breakdown organization.
33.02 Describe work group organization schemes including functional and hierarchical schemes.
33.03 Describe the function of management in general and project management in particular.
33.04 Describe a typical design project team structure.
33.05 Outline a research methodology.
33.06 Describe brain-storming.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600470
Course Title: Applied Technology Systems
Course Credit: 0.5

COURSE DESCRIPTION:

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work state and within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evaluation.

03.03 Discuss advantages and disadvantages in the application of technologies.

03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.

03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.

04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.

04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.

04.04 Distinguish fact from opinion.

04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.

04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.

04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.

04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.

04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.

04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.

04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.

04.14 Use the mathematics of:
- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.

04.16 Use elementary concepts of probability and statistics.

04.17 Draw, read, and analyze graphs, charts, and tables.

04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry: (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, orgainzational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

34.0 DISCUSS THE IMPACT OF TECHNOLOGY ON SOCIETY AND THE ENVIRONMENT--The student will be able to:

34.01 Discuss the impact of technology, now and in the future.
34.02 Discuss the impacts of technology on work, job opportunities and careers.
34.03 Identify the scope of technological impacts.
34.04 Identify means of controlling the world impacts of technology.
34.06 Discuss expected and unexpected impacts of technology.
34.07 Discuss desired and undesired impacts of technology.
34.08 Prepare a report on the impact of technology.

35.0 DEMONSTRATE AND APPLY MECHANICAL SYSTEM PRINCIPLES--The student will be able to:

35.01 Assemble, operate, and identify the parts of a system which demonstrates mechanical system principles.
35.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to mechanical systems.

36.0 DEMONSTRATE AND APPLY FLUID SYSTEM PRINCIPLES--The student will be able to:

36.01 Assemble, operate and identify the parts of a system which demonstrates fluid system principles.
36.02 Demonstrate and apply principle of force, work, rate, resistance, energy, power, and force transformers, relating to fluid systems.

37.0 DEMONSTRATE AND APPLY ELECTRICAL SYSTEM PRINCIPLES--The student will be able to:

37.01 Assemble, operate, and identify the parts of a system which demonstrates electrical system principles.
37.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to electrical systems.

38.0 DEMONSTRATE AND APPLY THERMAL SYSTEM PRINCIPLES--The student will be able to:

38.01 Assemble, operate, and identify the parts of a system which demonstrates thermal system principles.
38.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to thermal systems.

39.0 DEMONSTRATE THE USE OF A COMPUTER TO INTEGRATE AND CONTROL A SYSTEM COMPOSED OF MECHANICAL, FLUID AND ELECTRICAL SYSTEMS--The student will be able to:

39.01 Diagram an integrated system incorporating input, monitoring, controlling, output and feedback components.
39.02 Perform experiments using mechanical, fluid and electrical components in an integrated system.

39.03 Assemble, operate and identify the parts of computer controlled mechanical, fluid, and electrical systems.

40.0 DEMONSTRATE THE USE OF SENSORS TO CONTROL SYSTEMS--The student will be able to:

40.01 Perform experiments using electronic sensors.
40.02 Assemble, operate and identify the types of sensors used in technology.
40.03 Write a report on the applications of sensors use in technology.

41.0 DEMONSTRATE THE USE OF FIBER OPTICS CONCEPTS--The student will be able to:

41.01 Write a report on the application of fiber optics used in technology.
41.02 Perform fiber optics experiments.
41.03 Assemble, operate and identify the parts of a fiber optics system.

42.0 DEMONSTRATE THE USE OF LASER OPTICS CONCEPTS--The student will be able to:

42.01 Write a report on the applications of laser optics used in technology.
42.02 Perform laser optics experiments.
42.03 Assemble, operate and identify the parts of a laser optics system.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600480
Course Title: Home Technology Systems
Course Credit: 0.5

COURSE DESCRIPTION:

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work state and within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evaluation.

03.03 Discuss advantages and disadvantages in the application of technologies.

03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.

03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.

04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.

04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.

04.04 Distinguish fact from opinion.

04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.

04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.

04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.

04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.

04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.

04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.

04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.

04.14 Use the mathematics of:
- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.

04.16 Use elementary concepts of probability and statistics.

04.17 Draw, read, and analyze graphs, charts, and tables.

04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.

04.19 Organize and communicate the results obtained by observation and experimentation.

04.20 Apply the basic principles of biology, physics, and chemistry: (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).

04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, orgainzational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

43.0 IDENTIFY AND LIST THE DIFFERENT SYSTEMS FOUND IN NEW HOMES UNDER CONSTRUCTION TODAY--The student will be able to:

43.01 Identify systems used and install in home construction.
43.02 Develop a schedule of routine home system preventative maintenance.
43.03 Identify recent advances in home maintenance technology.

44.0 DRAW UP A BILL OF MATERIALS REQUIRED TO REPAIR A SELECTED COMPONENT IN A HOME TECHNOLOGY SYSTEM--The student will be able to:

44.01 Identify a system component requiring repair.
44.02 Identify the problem and parts required to make repairs.
44.03 Estimate the cost of repair.

45.0 APPLY HOME MAINTENANCE TECHNOLOGY SKILLS TO A SELECTED SYSTEM REQUIRING REPAIR--The student will be able to:

45.01 Identify and assemble the tools required to perform the repair.
45.02 Demonstrate a knowledge of problem-solving approaches to handle home maintenance needs.
45.03 Demonstrate consumer technical knowledge about home maintenance tools, materials and equipment.
45.04 List ways in which a personal computer may be used for home maintenance purposes.

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Technology Applications I
Occupational Area:	Technology Education
	Secondary
Program Numbers	**8600500**
CIP Number	0821.011100
Grade Level	9-12, 30, 31
Length	4 credits
Certification	INDUS ARTS @4 @6 I ART-TEC 1 @2

I. **MAJOR CONCEPTS/CONTENT:** The purpose of this program is to provide students with a foundation of knowledge and technically oriented experiences in the study of the applications of technology and its effect upon our lives and the choosing of an occupation. The content and activities will also include the study of entrepreneurship, safety, and leadership skills. This program focuses on transferable skills and stresses understanding and demonstration of the technological tolls, machines, instruments, materials, processes and systems in business and industry.

The courses include basic level I content in Technology Studies, Production Technology, Engineering Technology, and Aerospace Technology. The Level II and III courses in these curriculum areas are found in TECHNOLOGY APPLICATIONS II and TECHNOLOGY APPLICATIONS III. It should be noted that articulation agreements between secondary and postsecondary institutions may permit one or more different Technology Education courses to be selected in sequence and given credit toward Diploma or Associate Degree studies at the postsecondary levels depending upon student goals and the articulation agreements.

Listed below are the level I courses which are the initial courses in the Technology Applications I thru III sequence offered at secondary schools followed by the laboratory design codes appropriate for the courses.

8600510 - Technology Studies I (243)
8600540 - Production Technology I (243)
8600570 - Engineering Technology I (243)
8600580 - Aerospace Technology I (243)

II. **LABORATORY ACTIVITIES:** Instruction and learning activities are provided in a laboratory setting using hands-on experiences with technology equipment, tools and materials appropriate to the course content.

III. **SPECIAL NOTE:** The Florida Technology Student Association (FL-TSA)is the appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. Vocational student organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

In accordance with HB 2489 - Section 42, approved by the Florida Legislature and signed into law June 16, 1995, Technology Education students who have completed a minimum of three sequential credits in an eligible technology education program by the end of school year 1995-96 and thereafter will be eligible for the Gold Seal designation. The student must also continue in a planned, related post secondary education program.

IV. **INTENDED OUTCOMES**: After successfully completing this program, the student will be able to:

01.0 Demonstrate the ability to work safely with a variety of technologies.
02.0 Demonstrate interpersonal skills as they relate to the workplace.
03.0 Identify and apply methods of information acquisition and utilization.
04.0 Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05.0 Demonstrate and apply design/problem-solving processes.
06.0 Express an understanding of technological systems and their complex interrelationships.
07.0 Demonstrate the ability to properly identify, organize, plan, and allocate resources.
08.0 Discuss individual interests and aptitudes as they relate to a career.
09.0 Demonstrate employability skills.
10.0 Demonstrate an understanding of entrepreneurship.
11.0 Make an informed and meaningful career choice.
12.0 Identify evolving technologies in our technological world.
13.0 Demonstrate knowledge of the basic principles of technology, the basic elements of all systems, and the components of each basic element.
14.0 Demonstrate knowledge and perform special skills unique to the physical technologies.
15.0 Demonstrate knowledge and perform special skills unique to the information/communication technologies.
16.0 Demonstrate knowledge and perform special skills unique to the biotechnologies.
17.0 Identify kinds and levels of work common to production technology.
18.0 List requisites and career opportunities for employment in production technology.
19.0 Describe the processes related to industrial materials and composites.
20.0 Perform processing skills as it relates to industrial materials and composites.
21.0 Produce a custom product from industrial materials and composites using preprocessing, processing, and postprocessing production technology skills.

22.0 Demonstrate and apply fluid system principles.

23.0 Demonstrate and apply thermal system principles.

24.0 Demonstrate and apply electrical system principles.

25.0 Demonstrate and apply mechanical system principles.

26.0 Communicate through oral, written or graphic means the results of solutions or designs.

27.0 Demonstrate graphical literacy and use of graphical representations in analysis and design.

28.0 Describe the legal, ethical, social and economic factors that influence engineering design.

29.0 Provide evidence of research into the history and development of aviation, unmanned space flight, manned space exploration, and the exploration and discovery of the universe.

30.0 Demonstrate an understanding of computer-assisted word processing, data-base and spread-sheet applications for research and development projects.

31.0 Demonstrate an understanding of power systems including; jet engines, internal combustion engines, rocket engines, solar cells, and nuclear power.

32.0 Demonstrate technical knowledge of CAD as it relates to producing plans for aerospace projects.

33.0 Demonstrate an application of CAM as it relates to manufacturing processes for aerospace technology projects.

34.0 Demonstrate a knowledge of robotics.

35.0 Demonstrate a knowledge of computer control technology.

36.0 Perform processing skills on materials and composites as they relate to aerospace technology.

37.0 Produce aerospace vehicles to demonstrate the principles of flight.

38.0 Describe the aerospace environment.

39.0 Explore the role of civilian spacecraft in the exploration and colonization of space.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Technology Applications I
Secondary Number: 8600500
Postsecondary Number:

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.

03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.

04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.

04.19 Organize and communicate the results obtained by observation and experimentation.

04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).

04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.

05.03 Design and implement the optimal solution to a given problem.

05.04 Document each step of the design/problem-solving process.

05.05 Demonstrate "brainstorming" as a process to solve problems.

05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.

06.02 Explore methods used to monitor and correct performance of technological systems.

06.03 Design and implement an optimal solution to a given problem.

06.04 Outline major historical technological developments or events.

06.05 Identify recent advances in technology.

06.06 Explain problem-solving roles of technology.

06.07 Forecast a technological development or event.

06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.

07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.

07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.

07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 IDENTIFY EVOLVING TECHNOLOGIES IN OUR TECHNOLOGICAL WORLD--The student will be able to:

12.01 List five technologies that did not exist five years ago.
12.02 Use the problem-solving process to generate three potential improvements to a recent, or evolving technology.

13.0 DEMONSTRATE KNOWLEDGE OF THE BASIC PRINCIPLES OF TECHNOLOGY, THE BASIC ELEMENTS OF ALL SYSTEMS, AND THE COMPONENTS OF EACH BASIC ELEMENT--The student will be able to:

13.01 Define the six basic principles of technology: force, work, rate, resistance, energy, and power.
13.02 Name and define the three basic elements of all systems.
13.03 Name components of the three basic elements of a system.

13.04 Name the six basic parts of the energy system.
13.05 State the function of each of the basic parts of the energy system.
13.06 Name and explain the functions of the four common working energy systems: mechanical, electrical, fluid, and thermal.

14.0 DEMONSTRATE KNOWLEDGE AND PERFORM SPECIAL SKILLS UNIQUE TO THE PHYSICAL TECHNOLOGIES--The student will be able to:

14.01 Define the function of construction technology, energy and power technology, manufacturing technology, and transportation technology.
14.02 Describe three careers for each of the physical technologies identified in 14.01.
14.03 Identify and demonstrate the tools, processes, and materials used in construction technology.
14.04 Identify and demonstrate the equipment, processes, and materials used in energy and power technology for converting and transmitting power.
14.05 Identify and demonstrate the tools, processes, and materials used in manufacturing technology to perform computer-aided manufacturing.
14.06 Identify and demonstrate various ways that people and goods are transported.
14.07 Demonstrate problem-solving skills relative to the physical technologies utilizing the techniques learned in this course.

15.0 DEMONSTRATE KNOWLEDGE AND PERFORM SPECIAL SKILLS UNIQUE TO THE INFORMATION/COMMUNICATION TECHNOLOGIES--The student will be able to:

15.01 Define the function of information processing technology, graphic communication technology, and electronic communication technology.
15.02 Describe three careers for each of the communications technologies identified in 15.01.
15.03 Identify and demonstrate the tools, processes and materials used in the information/communication technologies.
15.04 Compare and contrast different processes of communication technologies.
15.05 Demonstrate modern communication systems using sound and speech, symbols and codes, printed words, drawing and pictures.
15.06 Identify the function of information processing technology, graphic communication technology, and electronic communication technology.
15.07 Identify several telecommunication services.
15.08 Demonstrate problem-solving skills relative to the information communication technologies utilizing the techniques learned in this course.

16.0 DEMONSTRATE KNOWLEDGE AND PERFORM SPECIAL SKILLS UNIQUE TO THE BIOTECHNOLOGIES--The student will be able to:

16.01 Define the function of biotechnology, medical technology, food production technology, and agriculture technology.
16.02 Describe three careers for each of the technology areas in 16.01.
16.03 Explain the three areas into which modern biotechnology is divided.
16.04 Contrast the seven resources for biotechnology with other technologies.
16.05 Identify several impacts of biotechnology on society and the environment.
16.06 Identify the role of biotechnology in agriculture, food production, and medicine.
16.07 Identify and describe the processes used in biotechnology and the related areas of produce outputs.
16.08 Identify several outputs of biotechnology and their related biotechnologies.
16.09 Demonstrate problem solving skills relative to biotechnology, or a related biotechnology utilizing the techniques learned in this course.

17.0 IDENTIFY KINDS AND LEVELS OF WORK COMMON TO PRODUCTION TECHNOLOGY--The student will be able to:

17.01 Identify kinds of work related to materials and processes technologies.
17.02 Identify kinds of work related to manufacturing technologies.
17.03 Identify kinds of work related to construction technologies.
17.04 Identify semiskilled, skilled and professional levels of work in materials and processes technologies.
17.05 Identify semiskilled, skilled, and professional levels of work in manufacturing technologies.
17.06 Identify semiskilled, skilled, and professional levels of work in construction technologies.

18.0 LIST REQUISITES AND CAREER OPPORTUNITIES FOR EMPLOYMENT IN PRODUCTION TECHNOLOGY--The student will be able to:

18.01 List occupations, job requirements, and employment opportunities in materials and processes, manufacturing construction technology.
18.02 List occupational training programs and academic programs and the postsecondary levels in production technology.

19.0 DESCRIBE THE PROCESSES RELATED TO INDUSTRIAL MATERIALS AND COMPOSITES--The student will be able to:

19.01 Describe preprocessing functions.
19.02 Describe processing functions.
19.03 Describe postprocessing functions.

20.0 PERFORM PREPROCESSING SKILLS AS IT RELATES TO INDUSTRIAL MATERIALS AND COMPOSITES--The student will be able to:

20.01 Design a product.
20.02 Prepare a product materials list.
20.03 Prepare a product production procedure list.
20.04 Locate and order products and materials.
20.05 Store and protect product materials properly.

21.0 PRODUCE A CUSTOM PRODUCT FROM INDUSTRIAL MATERIALS AND COMPOSITES USING PREPROCESSING, PROCESSING, AND POSTPROCESSING PRODUCTION TECHNOLOGY SKILLS--The student will be able to:

21.01 Apply the technology processes of separating and forming materials.
21.02 Apply the technology processes of conditioning materials.
21.03 Apply the technology processes of combining in the fabrication and finishing of materials.
21.04 Apply modern production technology practices and equipment in the processes of separating, forming, conditioning, fabricating and finishing of materials (CNC, CAD, CAM, Robotics, etc.).
21.05 Assemble a product.

22.0 DEMONSTRATE AND APPLY FLUID SYSTEM PRINCIPLES--The student will be able to:

22.01 Assemble, operate, and identify the parts of a system which demonstrates fluid system principles.
22.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to fluid systems.

23.0 DEMONSTRATE AND APPLY THERMAL SYSTEM PRINCIPLES--The student will be able to:

23.01 Assemble, operate, and identify the parts of a system which demonstrates thermal system principles.
23.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to thermal systems.

24.0 DEMONSTRATE AND APPLY ELECTRICAL SYSTEM PRINCIPLES--The student will be able to:

24.01 Assemble, operate, and identify the parts of a system which demonstrates electrical system principles.
24.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to electrical systems.

25.0 DEMONSTRATE AND APPLY MECHANICAL SYSTEM PRINCIPLES--The student will be able to:

25.01 Assemble, operate, and identify the parts of a system which demonstrates mechanical systems principles.
25.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to mechanical systems.

26.0 COMMUNICATE THROUGH ORAL, WRITTEN, OR GRAPHIC MEANS, THE RESULTS OF SOLUTIONS OR DESIGNS--The student will be able to:

26.01 Understand and interpret basic engineering drawings.
26.02 Measure quantities and conduct basic tests according to published procedures.
26.03 Use precision measuring tools and instruments to layout, measure and inspect parts or articles.
26.04 Sketch objects using multi-view and pictorial principles.
26.05 Prepare drawings using basic technical drawing instruments for orthographic and isometric projections.
26.06 Use engineering design graphics and descriptive geometry in the solution of design problems.
26.07 Describe graphic communications principles.

27.0 DEMONSTRATE GRAPHICAL LITERACY AND THE USE OF GRAPHICAL REPRESENTATIONS IN ANALYSIS AND DESIGN--The student will be able to:

27.01 Identify the basic tools and instruments for engineering design graphics.
27.02 Express knowledge and basic theory in engineering design graphics.
27.03 Make a technological decision relate to engineering design graphics.
27.04 Interpret engineering design graphics, using various systems of measurement.
27.05 Define and outline steps in the engineering design graphics process.
27.06 Describe the use of sketches and assembly drawings in the engineering design process.
27.07 Use engineering design graphics to describe the solution of an engineering problem.

28.0 DESCRIBE THE LEGAL ETHICAL SOCIAL, AND ECONOMIC FACTORS THAT INFLUENCE ENGINEERING DESIGN--The student will be able to:

28.01 Discuss the legal constraints placed on the practice of engineering.
28.02 Discuss the underlying principles of professional ethics.
28.03 Discuss the underlying principles of business (i.e., industrial) ethics.
28.04 Describe how economics and resource availability can influence design.
28.05 Explain the need and use of design standards.
28.06 Describe the legal protection afforded and inventor or designer.

29.0 PROVIDE EVIDENCE OF RESEARCH INTO THE HISTORY AND DEVELOPMENT OF AVIATION, UNMANNED SPACE FLIGHT, MANNED SPACE EXPLORATION, AND THE EXPLORATION AND DISCOVERY OF THE UNIVERSE--The student will be able to:

29.01 Define aerospace.
29.02 Describe early attempts at flight prior to the Wright Brothers flight in 1902.
29.03 Outline the early attempts at heavier than air powered flight prior to WWI.
29.04 Describe the affect of airpower on the outcome of world conflict.
29.05 Outline the beginnings of commercial aviation.
29.06 Identify the early research centers for aeronautics in the US.
29.07 Describe the role of aviation research and development.
29.08 Outline the development of space exploration
29.09 Describe the role of NACA and NASA in the development of aeronautics and space exploration.
29.10 Prepare a forecast of aerospace developments, and interplanetary space travel.

30.0 DEMONSTRATE AN UNDERSTANDING OF COMPUTER ASSISTED WORD PROCESSING, DATA BASE AND SPREAD SHEET APPLICATIONS FOR RESEARCH AND DEVELOPMENT PROJECTS--The student will be able to:

30.01 Demonstrate an ability to use a word processing program to prepare reports, outlines and descriptions of experiments, research and library projects related to aerospace technology.
30.02 Demonstrate an ability to use a computer based data base program to record, and communicate results from aerospace experiments.
30.03 Demonstrate an ability to use a spreadsheet application to record, compute and communicate mathematical and scientific data from an experimental aerospace activity.

31.0 DEMONSTRATE AN UNDERSTANDING OF POWER SYSTEMS INCLUDING, INTERNAL COMBUSTION ENGINES, JET ENGINES, ROCKET ENGINES, SOLAR CELLS AND NUCLEAR POWER USED IN AEROSPACE APPLICATIONS--The student will be able to:

31.01 Demonstrate an ability to assemble and operate a model reciprocating airplane engine.
31.02 Name the basic types of engines used for aircraft propulsion.
31.03 Describe the change from linear motion to rotary motion in a reciprocating engine.
31.04 Identify the elements of an aircraft engine/fuel systems.
31.05 Describe the operation of aircraft turbine and ramjet engines.
31.06 Explain the application of Newton's laws to rocketry.
31.07 Diagram a rocket system including the airframe, propulsion, guidance and control.
31.08 Explain chemical propulsion systems.
31.09 Explain advanced propulsion systems including heavy lift launch systems, electrical propulsion, and nuclear propulsion.
31.10 Describe the use and operation solar cells to generate electrical power.

31.11 Perform experimental testing, including designing test devices to determine the power (thrust) of a model rocket engine.

32.0 DEMONSTRATE TECHNICAL KNOWLEDGE OF CAD AS IT IS RELATED TO PRODUCING PLANS FOR AEROSPACE PROJECTS--The student will be able to:

32.01 Demonstrate the application of a computer and software program to develop a plan for an aerospace vehicle.
32.02 Demonstrate problem solving skills relative to computer aided drafting utilizing the techniques learned in this course.

33.0 DEMONSTRATE AN APPLICATION OF CAM AS IT RELATES TO MANUFACTURING PROCESSES FOR AEROSPACE TECHNOLOGY PROJECTS--The student will be able to:

33.01 Demonstrate an ability to perform a milling, engraving or turning operation utilizing a computer assisted manufacturing program.
33.02 Demonstrate problem solving skills relative to computer assisted manufacturing utilizing the techniques learned in this course.

34.0 DEMONSTRATE A KNOWLEDGE OF ROBOTICS--The student will be able to:

34.01 Identify three types of robots.
34.02 State the function of effectors, sensors, controllers, and auxiliary parts in robotics system.
34.03 Program a robot using computer to perform a specific task using machine language.
34.04 Explain how robotics technology is used in the space program.
34.05 Demonstrate problem solving skills using robotics technology as it applies to aerospace technology experiments and programs.
34.06 Forecast how robotics technology will be used in the exploration of space, space colonization or interplanetary space travel.

35.0 DEMONSTRATE A KNOWLEDGE OF COMPUTER CONTROL TECHNOLOGY--The student will be able to:

35.01 Write programs in Logo Computer Language.
35.02 Demonstrate an ability to develop programs to control simple machines using Logo programming language.

36.0 PERFORM PROCESSING SKILLS ON MATERIALS AND COMPOSITES AS THEY RELATE TO AEROSPACE TECHNOLOGY--The student will be able to:

36.01 Identify tools, machines and equipment in the laboratory and explain their functions.
36.02 Select appropriate tools, machines and equipment to accomplish a given task.
36.03 Demonstrate safe and correct use of tools, machines and equipment.
36.04 Identify various industrial raw materials.
36.05 Identify and explain the composition of composite materials.

36.06 Perform processing skills on materials and composites as needed to develop aerospace vehicles, models experimental fixtures and apparatus.

37.0 PRODUCE AEROSPACE VEHICLES TO DEMONSTRATE THE PRINCIPLES OF FLIGHT--The student will be able to:

37.01 Identify the structural components of aircraft.
37.02 Construct flying models of lighter than air craft.
37.03 Construct flying models of kites to demonstrate the properties of lift.
37.04 Construct flying models of a glider to specific design specifications.
37.05 Construct flying models of a powered aircraft, using control surfaces to control flight characteristics of pitch, yaw and roll.
37.06 Construct a flying model of a research aircraft of ones own design.
37.07 Construct a flying model of an aircraft to demonstrate the use of radio control technology.
37.08 Design and build a model single stage rocket.
37.09 Construct a model rocket designed to carry a specific payload.
37.10 Construct a model rocket that utilizes multi staging.
37.11 Construct a model rocket launch control system.
37.12 Design and build an alternate recovery system for recovery of a rocket payload.
37.13 Design, build and test a boost glider model rocket system.
37.14 Plan, organize, and control a model rocketry contest.

38.0 DESCRIBE THE AEROSPACE ENVIRONMENT--The student will be able to:

38.01 Identify atmospheric regions and elements.
38.02 Describe the roles of water and particulate matter in the atmosphere.
38.03 Describe and identify the elements of the atmosphere in motion. Define weather.
38.04 Explain the role weather forecasting has as it related to aerospace technology.
38.05 Demonstrate an understanding of the principle bodies of the universe.
38.06 Utilize astronomical principles, and technology to study the solar systems.
38.07 Develop a radio telemetry system to measure temperature, pressure, humidity, or acceleration during a rocket flight.
38.08 Define interplanetary space.
38.09 Describe the physical properties of interplanetary space including the structure of the sun, its formation and future, magnetosphere and solar winds, radiation belts, cislunar space and meteoroids.
38.10 Describe interstellar and intragalactic space.

39.0 EXPLORE THE ROLE OF CIVILIAN SPACECRAFT IN THE EXPLORATION AND COLONIZATION OF SPACE--The student will be able to:

39.01 Participate in the development of a study for a model of manned interplanetary space travel.

39.02 Develop a plan for scientific research to be performed on a space station facility.

39.03 Develop a plan for flight crew training for a manned space flight.

39.04 Research, develop, plan, and build model structures of space colonization structures.

39.05 Develop plans, models and a visual presentation of a manned space flight to a distant planet in the solar system.

39.06 Examine methods of sending and receiving messages and controlling telemetry from space.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600510
Course Title: Technology Studies I
Course Credit: 1

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations, and technological skills found today in technical professions.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  - integers, fractions, and decimals;
  - ratios, proportions, and percentages;
  - roots and powers;
  - algebra;
  - geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 IDENTIFY EVOLVING TECHNOLOGIES IN OUR TECHNOLOGICAL WORLD--The student will be able to:

12.01 List five technologies that did not exist five years ago.
12.02 Use the problem-solving process to generate three potential improvements to a recent, or evolving technology.

13.0 DEMONSTRATE KNOWLEDGE OF THE BASIC PRINCIPLES OF TECHNOLOGY, THE BASIC ELEMENTS OF ALL SYSTEMS, AND THE COMPONENTS OF EACH BASIC ELEMENT--The student will be able to:

13.01 Define the six basic principles of technology: force, work, rate, resistance, energy, and power.
13.02 Name and define the three basic elements of all systems.

13.03 Name components of the three basic elements of a system.
13.04 Name the six basic parts of the energy system.
13.05 State the function of each of the basic parts of the energy system.
13.06 Name and explain the functions of the four common working energy systems: mechanical, electrical, fluid, and thermal.

14.0 DEMONSTRATE KNOWLEDGE AND PERFORM SPECIAL SKILLS UNIQUE TO THE PHYSICAL TECHNOLOGIES--The student will be able to:

14.01 Define the function of construction technology, energy and power technology, manufacturing technology, and transportation technology.
14.02 Describe three careers for each of the physical technologies identified in 14.01.
14.03 Identify and demonstrate the tools, processes, and materials used in construction technology.
14.04 Identify and demonstrate the equipment, processes, and materials used in energy and power technology for converting and transmitting power.
14.05 Identify and demonstrate the tools, processes, and materials used in manufacturing technology to perform computer-aided manufacturing.
14.06 Identify and demonstrate various ways that people and goods are transported.
14.07 Demonstrate problem-solving skills relative to the physical technologies utilizing the techniques learned in this course.

15.0 DEMONSTRATE KNOWLEDGE AND PERFORM SPECIAL SKILLS UNIQUE TO THE INFORMATION/COMMUNICATION TECHNOLOGIES--The student will be able to:

15.01 Define the function of information processing technology, graphic communication technology, and electronic communication technology.
15.02 Describe three careers for each of the communications technologies identified in 15.01.
15.03 Identify and demonstrate the tools, processes and materials used in the information/communication technologies.
15.04 Compare and contrast different processes of communication technologies.
15.05 Demonstrate modern communication systems using sound and speech, symbols and codes, printed words, drawing and pictures.
15.06 Identify the function of information processing technology, graphic communication technology, and electronic communication technology.
15.07 Identify several telecommunication services.
15.08 Demonstrate problem-solving skills relative to the information communication technologies utilizing the techniques learned in this course.

16.0 DEMONSTRATE KNOWLEDGE AND PERFORM SPECIAL SKILLS UNIQUE TO THE BIOTECHNOLOGIES--The student will be able to:

16.01 Define the function of biotechnology, medical technology, food production technology, and agriculture technology.

16.02 Describe three careers for each of the technology areas in 16.01.

16.03 Explain the three areas into which modern biotechnology is divided.

16.04 Contrast the seven resources for biotechnology with other technologies.

16.05 Identify several impacts of biotechnology on society and the environment.

16.06 Identify the role of biotechnology in agriculture, food production, and medicine.

16.07 Identify and describe the processes used in biotechnology and the related areas of produce outputs.

16.08 Identify several outputs of biotechnology and their related biotechnologies.

16.09 Demonstrate problem solving skills relative to biotechnology, or a related biotechnology utilizing the techniques learned in this course.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600540
Course Title: Production Technology I
Course Credit: 1

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations, and technological skills found today in technical professions.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.

03.02 Identify and describe methods of information acquisition and evalution.

03.03 Discuss advantages and disadvantages in the application of technologies.

03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.

03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.

04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.

04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.

04.04 Distinguish fact from opinion.

04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.

04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.

04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.

04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.

04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.

04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.

04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.

04.14 Use the mathematics of:

- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

17.0 IDENTIFY KINDS AND LEVELS OF WORK COMMON TO PRODUCTION TECHNOLOGY--The student will be able to:

17.01 Identify kinds of work related to materials and processes technologies.
17.02 Identify kinds of work related to manufacturing technologies.
17.03 Identify kinds of work related to construction technologies.
17.04 Identify semiskilled, skilled and professional levels of work in materials and processes technologies.
17.05 Identify semiskilled, skilled, and professional levels of work in manufacturing technologies.
17.06 Identify semiskilled, skilled, and professional levels of work in construction technologies.

18.0 LIST REQUISITES AND CAREER OPPORTUNITIES FOR EMPLOYMENT IN PRODUCTION TECHNOLOGY--The student will be able to:

18.01 List occupations, job requirements, and employment opportunities in materials and processes, manufacturing construction technology.
18.02 List occupational training programs and academic programs and the postsecondary levels in production technology.

19.0 DESCRIBE THE PROCESSES RELATED TO INDUSTRIAL MATERIALS AND COMPOSITES--The student will be able to:

19.01 Describe preprocessing functions.
19.02 Describe processing functions.
19.03 Describe postprocessing functions.

20.0 PERFORM PREPROCESSING SKILLS AS IT RELATES TO INDUSTRIAL MATERIALS AND COMPOSITES--The student will be able to:

20.01 Design a product.
20.02 Prepare a product materials list.
20.03 Prepare a product production procedure list.
20.04 Locate and order products and materials.
20.05 Store and protect product materials properly.

21.0 PRODUCE A CUSTOM PRODUCT FROM INDUSTRIAL MATERIALS AND COMPOSITES USING PREPROCESSING, PROCESSING, AND POSTPROCESSING PRODUCTION TECHNOLOGY SKILLS--The student will be able to:

21.01 Apply the technology processes of separating and forming materials.
21.02 Apply the technology processes of conditioning materials.
21.03 Apply the technology processes of combining in the fabrication and finishing of materials.
21.04 Apply modern production technology practices and equipment in the processes of separating, forming, conditioning, fabricating and finishing of materials (CNC, CAD, CAM, Robotics, etc.).
21.05 Assemble a product.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600570
Course Title: Engineering Technology I
Course Credit: 1

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations, and technological skills found today in technical professions.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  - integers, fractions, and decimals;
  - ratios, proportions, and percentages;
  - roots and powers;
  - algebra;
  - geometry.

BEST COPY AVAILABLE

04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

22.0 DEMONSTRATE AND APPLY FLUID SYSTEM PRINCIPLES--The student will be able to:

22.01 Assemble, operate, and identify the parts of a system which demonstrates fluid system principles.
22.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to fluid systems.

23.0 DEMONSTRATE AND APPLY THERMAL SYSTEM PRINCIPLES--The student will be able to:

23.01 Assemble, operate, and identify the parts of a system which demonstrates thermal system principles.

23.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to thermal systems.

24.0 DEMONSTRATE AND APPLY ELECTRICAL SYSTEM PRINCIPLES--The student will be able to:

24.01 Assemble, operate, and identify the parts of a system which demonstrates electrical system principles.
24.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to electrical systems.

25.0 DEMONSTRATE AND APPLY MECHANICAL SYSTEM PRINCIPLES--The student will be able to:

25.01 Assemble, operate, and identify the parts of a system which demonstrates mechanical systems principles.
25.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to mechanical systems.

26.0 COMMUNICATE THROUGH ORAL, WRITTEN, OR GRAPHIC MEANS, THE RESULTS OF SOLUTIONS OR DESIGNS--The student will be able to:

26.01 Understand and interpret basic engineering drawings.
26.02 Measure quantities and conduct basic tests according to published procedures.
26.03 Use precision measuring tools and instruments to layout, measure and inspect parts or articles.
26.04 Sketch objects using multi-view and pictorial principles.
26.05 Prepare drawings using basic technical drawing instruments for orthographic and isometric projections.
26.06 Use engineering design graphics and descriptive geometry in the solution of design problems.
26.07 Describe graphic communications principles.

27.0 DEMONSTRATE GRAPHICAL LITERACY AND THE USE OF GRAPHICAL REPRESENTATIONS IN ANALYSIS AND DESIGN--The student will be able to:

27.01 Identify the basic tools and instruments for engineering design graphics.
27.02 Express knowledge and basic theory in engineering design graphics.
27.03 Make a technological decision relate to engineering design graphics.
27.04 Interpret engineering design graphics, using various systems of measurement.
27.05 Define and outline steps in the engineering design graphics process.
27.06 Describe the use of sketches and assembly drawings in the engineering design process.
27.07 Use engineering design graphics to describe the solution of an engineering problem.

28.0 DESCRIBE THE LEGAL ETHICAL SOCIAL, AND ECONOMIC FACTORS THAT INFLUENCE ENGINEERING DESIGN--The student will be able to:

28.01 Discuss the legal constraints placed on the practice of engineering.
28.02 Discuss the underlying principles of professional ethics.
28.03 Discuss the underlying principles of business (i.e., industrial) ethics.
28.04 Describe how economics and resource availability can influence design.
28.05 Explain the need and use of design standards.
28.06 Describe the legal protection afforded and inventor or designer.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600580
Course Title: Aerospace Technology I
Course Credit: 1

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations, and technological skills found today in technical professions.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.

03.02 Identify and describe methods of information acquisition and evalution.

03.03 Discuss advantages and disadvantages in the application of technologies.

03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.

03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.

04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.

04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.

04.04 Distinguish fact from opinion.

04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.

04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.

04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.

04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.

04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.

04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.

04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.

04.14 Use the mathematics of:

- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

29.0 PROVIDE EVIDENCE OF RESEARCH INTO THE HISTORY AND DEVELOPMENT OF AVIATION, UNMANNED SPACE FLIGHT, MANNED SPACE EXPLORATION, AND THE EXPLORATION AND DISCOVERY OF THE UNIVERSE--The student will be able to:

29.01 Define aerospace.
29.02 Describe early attempts at flight prior to the Wright Brothers flight in 1902.
29.03 Outline the early attempts at heavier than air powered flight prior to WWI.
29.04 Describe the affect of airpower on the outcome of world conflict.
29.05 Outline the beginnings of commercial aviation.
29.06 Identify the early research centers for aeronautics in the US.
29.07 Describe the role of aviation research and development.

29.08 Outline the development of space exploration
29.09 Describe the role of NACA and NASA in the development of aeronautics and space exploration.
29.10 Prepare a forecast of aerospace developments, and interplanetary space travel.

30.0 DEMONSTRATE AN UNDERSTANDING OF COMPUTER ASSISTED WORD PROCESSING, DATA BASE AND SPREAD SHEET APPLICATIONS FOR RESEARCH AND DEVELOPMENT PROJECTS--The student will be able to:

30.01 Demonstrate an ability to use a word processing program to prepare reports, outlines and descriptions of experiments, research and library projects related to aerospace technology.
30.02 Demonstrate an ability to use a computer based data base program to record, and communicate results from aerospace experiments.
30.03 Demonstrate an ability to use a spreadsheet application to record, compute and communicate mathematical and scientific data from an experimental aerospace activity.

31.0 DEMONSTRATE AN UNDERSTANDING OF POWER SYSTEMS INCLUDING, INTERNAL COMBUSTION ENGINES, JET ENGINES, ROCKET ENGINES, SOLAR CELLS AND NUCLEAR POWER USED IN AEROSPACE APPLICATIONS--The student will be able to:

31.01 Demonstrate an ability to assemble and operate a model reciprocating airplane engine.
31.02 Name the basic types of engines used for aircraft propulsion.
31.03 Describe the change from linear motion to rotary motion in a reciprocating engine.
31.04 Identify the elements of an aircraft engine/fuel systems.
31.05 Describe the operation of aircraft turbine and ramjet engines.
31.06 Explain the application of Newton's laws to rocketry.
31.07 Diagram a rocket system including the airframe, propulsion, guidance and control.
31.08 Explain chemical propulsion systems.
31.09 Explain advanced propulsion systems including heavy lift launch systems, electrical propulsion, and nuclear propulsion.
31.10 Describe the use and operation solar cells to generate electrical power.
31.11 Perform experimental testing, including designing test devices to determine the power (thrust) of a model rocket engine.

32.0 DEMONSTRATE TECHNICAL KNOWLEDGE OF CAD AS IT IS RELATED TO PRODUCING PLANS FOR AEROSPACE PROJECTS--The student will be able to:

32.01 Demonstrate the application of a computer and software program to develop a plan for an aerospace vehicle.
32.02 Demonstrate problem solving skills relative to computer aided drafting utilizing the techniques learned in this course.

33.0 DEMONSTRATE AN APPLICATION OF CAM AS IT RELATES TO MANUFACTURING PROCESSES FOR AEROSPACE TECHNOLOGY PROJECTS--The student will be able to:

BEST COPY AVAILABLE

33.01 Demonstrate an ability to perform a milling, engraving or turning operation utilizing a computer assisted manufacturing program.
33.02 Demonstrate problem solving skills relative to computer assisted manufacturing utilizing the techniques learned in this course.

34.0 DEMONSTRATE A KNOWLEDGE OF ROBOTICS--The student will be able to:

34.01 Identify three types of robots.
34.02 State the function of effectors, sensors, controllers, and auxiliary parts in robotics system.
34.03 Program a robot using computer to perform a specific task using machine language.
34.04 Explain how robotics technology is used in the space program.
34.05 Demonstrate problem solving skills using robotics technology as it applies to aerospace technology experiments and programs.
34.06 Forecast how robotics technology will be used in the exploration of space, space colonization or interplanetary space travel.

35.0 DEMONSTRATE A KNOWLEDGE OF COMPUTER CONTROL TECHNOLOGY--The student will be able to:

35.01 Write programs in Logo Computer Language.
35.02 Demonstrate an ability to develop programs to control simple machines using Logo programming language.

36.0 PERFORM PROCESSING SKILLS ON MATERIALS AND COMPOSITES AS THEY RELATE TO AEROSPACE TECHNOLOGY--The student will be able to:

36.01 Identify tools, machines and equipment in the laboratory and explain their functions.
36.02 Select appropriate tools, machines and equipment to accomplish a given task.
36.03 Demonstrate safe and correct use of tools, machines and equipment.
36.04 Identify various industrial raw materials.
36.05 Identify and explain the composition of composite materials.
36.06 Perform processing skills on materials and composites as needed to develop aerospace vehicles, models experimental fixtures and apparatus.

37.0 PRODUCE AEROSPACE VEHICLES TO DEMONSTRATE THE PRINCIPLES OF FLIGHT--The student will be able to:

37.01 Identify the structural components of aircraft.
37.02 Construct flying models of lighter than air craft.
37.03 Construct flying models of kites to demonstrate the properties of lift.
37.04 Construct flying models of a glider to specific design specifications.

37.05 Construct flying models of a powered aircraft, using control surfaces to control flight characteristics of pitch, yaw and roll.
37.06 Construct a flying model of a research aircraft of ones own design.
37.07 Construct a flying model of an aircraft to demonstrate the use of radio control technology.
37.08 Design and build a model single stage rocket.
37.09 Construct a model rocket designed to carry a specific payload.
37.10 Construct a model rocket that utilizes multi staging.
37.11 Construct a model rocket launch control system.
37.12 Design and build an alternate recovery system for recovery of a rocket payload.
37.13 Design, build and test a boost glider model rocket system.
37.14 Plan, organize, and control a model rocketry contest.

38.0 DESCRIBE THE AEROSPACE ENVIRONMENT--The student will be able to:

38.01 Identify atmospheric regions and elements.
38.02 Describe the roles of water and particulate matter in the atmosphere.
38.03 Describe and identify the elements of the atmosphere in motion. Define weather.
38.04 Explain the role weather forecasting has as it related to aerospace technology.
38.05 Demonstrate an understanding of the principle bodies of the universe.
38.06 Utilize astronomical principles, and technology to study the solar systems.
38.07 Develop a radio telemetry system to measure temperature, pressure, humidity, or acceleration during a rocket flight.
38.08 Define interplanetary space.
38.09 Describe the physical properties of interplanetary space including the structure of the sun, its formation and future, magnetosphere and solar winds, radiation belts, cislunar space and meteoroids.
38.10 Describe interstellar and intragalactic space.

39.0 EXPLORE THE ROLE OF CIVILIAN SPACECRAFT IN THE EXPLORATION AND COLONIZATION OF SPACE--The student will be able to:

39.01 Participate in the development of a study for a model of manned interplanetary space travel.
39.02 Develop a plan for scientific research to be performed on a space station facility.
39.03 Develop a plan for flight crew training for a manned space flight.
39.04 Research, develop, plan, and build model structures of space colonization structures.
39.05 Develop plans, models and a visual presentation of a manned space flight to a distant planet in the solar system.
39.06 Examine methods of sending and receiving messages and controlling telemetry from space.

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Technology Applications II
Occupational Area:	Technology Education
	Secondary
Program Numbers	**8600600**
CIP Number	0821.011200
Grade Level	9-12, 30, 31
Length	4 credits
Certification	INDUS ARTS @4 @6 I ART-TEC 1 @2

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this program is to provide students with a foundation of knowledge and technically oriented experiences in the study of the applications of technology and its effect upon our lives and the choosing of an occupation. The content and activities will also include the study of entrepreneurship, safety, and leadership skills. This program focuses on transferable skills and stresses understanding and demonstration of the technological tolls, machines, instruments, materials, processes and systems in business and industry.

Laboratory experiences revolve around the physical technologies of construction, energy and power, manufacturing, material processing and transportation; information/communication technologies of information processing, graphic communication and electronic communications; and biotechnologies in agriculture, health care and medicine.

The content includes intermediate studies in areas of technology which include Technology Studies, Production, Engineering and Aerospace.

Listed below are the level II courses in the Technology Applications I thru III sequence offered at secondary schools followed by the laboratory design codes appropriate for the courses.

8600610 - Technology Studies II (243)
8600640 - Production Technology II (243)
8600670 - Engineering Technology II (243)
8600680 - Aerospace Technology II (243)

II. **LABORATORY ACTIVITIES**: Instruction and learning activities are provided in a laboratory setting using hands-on experiences with technology equipment, tools and materials appropriate to the course content.

III. **SPECIAL NOTE**: The Florida Technology Student Association (FL-TSA)is the appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. Vocational student organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Please note that the courses listed in this program may articulate into postsecondary Tech-Prep 2 + 2 programs when combined with a corresponding course listed under TECHNOLOGY APPLICATIONS III. Tech-Prep 2 + 2 programs require articulation agreements between secondary and post-secondary educational agencies.

In accordance with HB 2489 - Section 42, approved by the Florida Legislature and signed into law June 16, 1995, Technology Education students who have completed a minimum of three sequential credits in an eligible technology education program by the end of school year 1995-96 and thereafter will be eligible for the Gold Seal designation. The student must also continue in a planned, related post secondary education program.

IV. **INTENDED OUTCOMES:** After successfully completing this program, the student will be able to:

01.0 Demonstrate the ability to work safely with a variety of technologies.
02.0 Demonstrate interpersonal skills as they relate to the workplace.
03.0 Identify and apply methods of information acquisition and utilization.
04.0 Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05.0 Demonstrate and apply design/problem-solving processes.
06.0 Express an understanding of technological systems and their complex interrelationships.
07.0 Demonstrate the ability to properly identify, organize, plan, and allocate resources.
08.0 Discuss individual interests and aptitudes as they relate to a career.
09.0 Demonstrate employability skills.
10.0 Demonstrate an understanding of entrepreneurship.
11.0 Make an informed and meaningful career choice.
12.0 Demonstrate knowledge of the basic principles of technology, the basic elements of all systems, and the components of each basic element.
13.0 Demonstrate knowledge and perform special skills unique to the physical technologies.
14.0 Demonstrate knowledge and perform special skills unique to the information/communication technologies.
15.0 Demonstrate knowledge and perform special skills unique to the biotechnologies.
16.0 Demonstrate knowledge and application of robotics technology.
17.0 Demonstrate knowledge and application of programmable controller technology.
18.0 Demonstrate the techniques of computer numerical control technology.
19.0 Demonstrate knowledge and application of computer aided drafting technology.

20.0 Demonstrate knowledge and application of laser technology.

21.0 Plan and participate in a mass production system for manufacturing a product.

22.0 Perform the technological processes of separating and forming materials.

23.0 Utilize modern production technology in the processes of separating, forming, combining, fabrication and finishing of materials (CAM, CNC, Robotics, Work Cells).

24.0 Conduct a research and experimentation project on a production technology system.

25.0 Discuss engineering technology careers and practices.

26.0 Demonstrate the engineering analysis and design methods.

27.0 Demonstrate the engineering design reporting process as a team effort and individually.

28.0 Demonstrate technical knowledge of CAD as it relates to producing plans for aerospace projects.

29.0 Demonstrate an application of CAM as it relates to manufacturing processes for aerospace technology projects.

30.0 Demonstrate an understanding of electrical, mechanical, fluid, and pneumatic systems that could be used on/in space environments.

31.0 Demonstrate a knowledge of robotics.

32.0 Demonstrate a knowledge of computer control technology.

33.0 Perform processing skills on materials and composites as they relate to aerospace technology.

34.0 Develop test procedures for measuring and testing human performance in aerospace environments.

35.0 Produce aerospace vehicles to demonstrate the principles of flight.

36.0 Describe and demonstrate the principles of navigation.

37.0 Demonstrate appropriate skills in analyzing and evaluating technological advancements as reported by the media.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Technology Applications II
Secondary Number: 8600600
Postsecondary Number:

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evaluation.
03.03 Discuss advantages and disadvantages in the application of technologies.

03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.

03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.

04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.

04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.

04.04 Distinguish fact from opinion.

04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.

04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.

04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.

04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.

04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.

04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.

04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.

04.14 Use the mathematics of:

- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.

04.16 Use elementary concepts of probability and statistics.

04.17 Draw, read, and analyze graphs, charts, and tables.

04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.

04.19 Organize and communicate the results obtained by observation and experimentation.

04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).

04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.

05.03 Design and implement the optimal solution to a given problem.

05.04 Document each step of the design/problem-solving process.

05.05 Demonstrate "brainstorming" as a process to solve problems.

05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.

06.02 Explore methods used to monitor and correct performance of technological systems.

06.03 Design and implement an optimal solution to a given problem.

06.04 Outline major historical technological developments or events.

06.05 Identify recent advances in technology.

06.06 Explain problem-solving roles of technology.

06.07 Forecast a technological development or event.

06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.

07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.

07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.

07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.

08.02 Discuss individual interests related to a career.

08.03 Identify careers within specific areas of technology.

08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 DEMONSTRATE KNOWLEDGE OF THE BASIC PRINCIPLES OF TECHNOLOGY, THE BASIC ELEMENTS OF ALL SYSTEMS, AND THE COMPONENTS OF EACH BASIC ELEMENT--The student will be able to:

12.01 Define the six basic principles of technology: force, work, rate, resistance, energy, and power.
12.02 Name and define the three basic elements of all systems.
12.03 Name components of the three basic elements of a systems.
12.04 Name the six basic parts of the energy system.
12.05 State the function of each of the basic parts of the energy system.
12.06 Name and explain the functions of the four common working energy systems: mechanical, electrical, fluid, and thermal.

13.0 DEMONSTRATE KNOWLEDGE AND PERFORM SPECIAL SKILLS UNIQUE TO THE PHYSICAL TECHNOLOGIES--The student will be able to:

13.01 Define the function of construction technology, energy and power technology, manufacturing technology, and transportation technology.

13.02 Describe three careers for each of the physical technologies identified in 13.01.
13.03 Identify and demonstrate the tools, processes, and materials used in construction technology.
13.04 Identify and demonstrate the equipment, processes, and materials used in energy and power technology for converting and transmitting power.
13.05 Identify and demonstrate the tools, process, and materials used in manufacturing technology to perform computer-aided manufacturing.
13.06 Identify and demonstrate various ways that people and goods are transported.
13.07 Demonstrate problem-solving skills relative to the physical technologies utilizing the techniques learned in the course.

14.0 DEMONSTRATE KNOWLEDGE AND PERFORM SPECIAL SKILLS UNIQUE TO THE INFORMATION/COMMUNICATION TECHNOLOGIES--The student will be able to:

14.01 Define the function of information processing technology, graphic communication technology, and electronic communication technology.
14.02 Describe three careers for each of the communications technologies identified in 14.01.
14.03 Identified and demonstrate the tools, processes and materials used in the information/communication technologies.
14.04 Compare and contrast different processes of communication technologies.
14.05 Demonstrate modern communication systems using sound and speech, symbols and codes, printed works, drawing and pictures.
14.06 Identify the function of information processing technology, graphic communication technology, and electronic communication technology.
14.07 Identify several telecommunication services.
14.08 Demonstrate problem-solving skills relative to the information communication technologies utilizing the techniques learned in this course.

15.0 DEMONSTRATE KNOWLEDGE AND PERFORM SPECIAL SKILLS UNIQUE TO THE BIOTECHNOLOGIES--The student will be able to:

15.01 Define the function of biotechnology, medical technology, food production technology, and agriculture technology.
15.02 Describe three careers for each of the technology areas in 15.01.
15.03 Explain the three areas into which modern biotechnology is divided.
15.04 Contrast the seven resources for biotechnology with other technologies.
15.05 Identify several impacts of biotechnology on society and the environment.
15.06 Identify the role of biotechnology in agriculture, food production, and medicine.
15.07 Identify and describe the processes used in biotechnology and the related areas of produce outputs.

15.08 Identify several outputs of biotechnology and their related biotechnologies.
15.09 Demonstrate problem-solving skills relative to biotechnology, or a related biotechnology utilizing the techniques learned in this course.

16.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF ROBOTICS TECHNOLOGY--The student will be able to:

16.01 Identify three types of robots.
16.02 State the function of effectors, sensors, controllers, and auxiliary parts in a robotics system.
16.03 Operate a robot using a teach pendant.
16.04 Program a robot using a computer to perform a specific task.
16.05 Explain three impacts of robotics on society.
16.06 Demonstrate problem-solving skills relative to robotics utilizing the techniques learned in this course.

17.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF PROGRAMMABLE CONTROLLER TECHNOLOGY--The student will be able to:

17.01 State the function of the component parts of a programmable controller.
17.02 List several advantages of using programmable controllers.
17.03 Demonstrate logical continuity and branching functions with a programmable controller.

18.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF PROGRAMMABLE CONTROLLER TECHNOLOGY--The student will be able to:

18.01 Demonstrate the technique of computer numerical control to perform and engraving and a milling activity.
18.02 Demonstrate problem-solving skills relative to computer numerical control utilizing the techniques learned in this course.

19.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF COMPUTER-AIDED DRAFTING TECHNOLOGY--The student will be able to:

19.01 Compare and contrast computer-aided drafting with non-computer aided drafting in terms of speed consistency, neatness, and accuracy.
19.02 Demonstrate the application of a computer and software program indoing several computer-aided drawings.
19.03 Identify computer-aided drafting hardware.
19.04 Demonstrate program-solving skills relative to computer-aided drafting utilizing the techniques learned in this course.

20.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF LASER TECHNOLOGY--The student will be able to:

20.01 Describe five applications of lasers.
20.02 Perform laser experiments demonstrating knowledge of:
    20.02.01 Characteristics of laser light.

20.02.02 Characteristics of light waves.

20.03 List the safety precautions that one observes when working with a laser.

20.04 Assemble, operate and identify the parts of a laser optics system.

20.05 Demonstrate the use of a laser to do measurements, transmit data, and monitor.

21.0 PLAN AND PARTICIPATE IN A MASS PRODUCTION SYSTEM FOR MANUFACTURING A PRODUCT--The student will be able to:

21.01 Design jigs, fixtures, or a model system for product mass production.

21.02 Develop workable jigs, fixtures and/or a model system for product mass production.

21.03 Participate in the organized mass production of a product.

21.04 Demonstrate design/problem-solving processes.

22.0 PERFORM THE TECHNOLOGICAL PROCESSES OF SEPARATING AND FORMING MATERIALS--The student will be able to:

22.01 Perform materials-forming practices such as casting or molding, and compressing or stretching.

22.02 Perform materials separating practices such as shearing, chip removing, and other separating processes.

22.03 Demonstrate design/problem-solving processes.

23.0 UTILIZE MODERN PRODUCTION TECHNOLOGY IN THE PROCESSES OF SEPARATING, FORMING, COMBINING, FABRICATION, AND FINISHING OF MATERIALS (CAM, CNC, Robotics, Work Cells)--The student will be able to:

23.01 Design a program to be used in the separating forming and finishing of materials.

23.02 Develop and perform an operational program of forming materials.

23.03 Develop and perform an operational program of finishing materials.

23.04 Develop and perform an operational program that will use combination of production processes and materials.

23.05 Demonstrate design/problem-solving processes.

24.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON A PRODUCTION TECHNOLOGY SYSTEM--The student will be able to:

24.01 Identify a problem.
24.02 State a need to research the problem.
24.03 Form a hypothesis about the problem.
24.04 Plan the procedures for researching the problem.
24.05 Conduct the research following the planned procedures.
24.06 Present the research findings in a seminar.
24.07 State conclusions based on the research findings.

25.0 DISCUSS ENGINEERING TECHNOLOGY CAREERS AND PRACTICES--The student will be able to:

25.01 Summarize the professional characteristics of engineers.
25.02 List the principal fields for specialization in engineering.
25.03 Describe the procedures for becoming a registered engineer in Florida.
25.04 Describe the procedures for becoming a certified engineering technician.
25.05 Outline the typical steps to follow to prepare for a course of study leading to an engineering career.

26.0 DEMONSTRATE ENGINEERING ANALYSIS AND DESIGN METHODS--The student will be able to:

26.01 Define the terms: analysis, design, and application.
26.02 Define the experimental method as it is applied to design.
26.03 Describe methodology.
26.04 Describe simulation.
26.05 Prepare a model of a design solution to an engineering problem.
26.06 Prepare a graphical solution to an engineering problem.
26.07 Prepare a mathematical solution to an engineering problem (using either a calculator or computer).

27.0 DEMONSTRATE THE ENGINEERING DESIGN REPORTING PROCESS AS A TEAM EFFORT AND INDIVIDUALLY--The student will be able to:

27.01 Research an engineering acheivement and prepare a model, or display.
27.02 Deliver a short oral briefing which explains a technical device, process or achievement.
27.03 As a team, present a technical report on an engineering design problem, concept or issue.

28.0 DEMONSTRATE TECHNICAL KNOWLEDGE OF CAD AS IT IS RELATED TO PRODUCING PLANS FOR AEROSPACE PROJECTS--The student will be able to:

28.01 Demonstrate the application of a computer and software program to develop a plan for an aerospace vehicle.
28.02 Demonstrate problem solving skills relative to computer aided drafting utilizing the techniques learned in this course.

29.0 DEMONSTRATE AN APPLICATION OF CAM AS IT RELATES TO MANUFACTURING PROCESSES FOR AEROSPACE TECHNOLOGY PROJECTS--The student will be able to:

29.01 Demonstrate an ability to perform a milling, engraving or turning operation utilizing a computer assisted manufacturing program.
29.02 Demonstrate problem solving skills relative to computer assisted manufacturing utilizing the techniques learned in this course.

30.0 DEMONSTRATE A BASIC UNDERSTANDING OF ELECTRICAL, MECHANICAL, FLUID AND PNEUMATIC SYSTEMS THAT COULD BE USED ON/IN AEROSPACE ENVIRONMENTS--The student will be able to:

30.01 Demonstrate the concepts of force, work, rate, resistance, energy and power through the use of various mechanical sub systems to include: gears, belts, valves, chains, pulleys, screws, cams, linkages, rods, and sprockets or mechanical trainers.

30.02 Demonstrate the concepts of force, work rate, resistance, and power through the use of various fluid subsystems to include: fluid manometers, hydraulic lifts, pipes, valves, tanks, air gauges of hydraulic trainers, and pneumatic trainers.

30.03 Demonstrate the concepts of force, work, rate, resistance, energy, and power through the use of various electrical sub systems to include: conductors, control elements, electrical loads, voltage sources, current sources, circuits, components, and measurement equipment, or electrical/electronic trainers.

30.04 Demonstrate problem solving skills relative to electrical, mechanical or fluid systems related to aerospace technology experiments.

31.0 DEMONSTRATE A KNOWLEDGE OF ROBOTICS--The student will be able to:

31.01 Identify three types of robots.

31.02 State the function of effectors, sensors, controllers, and auxiliary parts in robotics system.

31.03 Program a robot using computer to perform a specific task using machine language.

31.04 Explain how robotics technology is used in the space program.

31.05 Demonstrate problem solving skills using robotics technology as it applies to aerospace technology experiments and programs.

31.06 Forecast how robotics technology will be used in the exploration of space, space colonization or interplanetary space travel.

32.0 DEMONSTRATE A KNOWLEDGE OF COMPUTER CONTROL TECHNOLOGY--The student will be able to:

32.01 Write programs in Logo Computer Language.

32.02 Demonstrate an ability to develop programs to control simple machines using Logo programming language.

33.0 PERFORM PROCESSING SKILLS ON MATERIALS AND COMPOSITES AS THEY RELATE TO AEROSPACE TECHNOLOGY--The student will be able to:

33.01 Identify tools, machines and equipment in the laboratory and explain their functions.

33.02 Select appropriate tools, machines and equipment to accomplish a given task.

33.03 Demonstrate safe and correct use of tools, machines and equipment.

33.04 Identify various industrial raw materials.

33.05 Identify and explain the composition of composite materials.

33.06 Perform processing skills on materials and composites as needed to develop aerospace vehicles, models experimental fixtures and apparatus.

34.0 DEVELOP TEST PROCEDURES FOR MEASURING AND TESTING HUMAN PERFORMANCE IN AEROSPACE ENVIRONMENTS--The student will be able to:

34.01 Construct human data charts to determine the variation in body dimensions of human subjects.
34.02 Evaluate products and fixtures used in aerospace environments and assess their suitability for human use.
34.03 Construct human manikins for use in determining human size as related to aerospace environments.
34.04 Develop test procedures for measuring human performance including but not limited to: visual perception, ability to withstand stress, ability to live in a restricted environment, requirements for nutrition, exercise and other physical needs as may be determined by research and development of aerospace projects.
34.05 Demonstrate an ability to control an aircraft in flight by using a computer flight simulator.
34.06 Demonstrate an ability to control an aircraft in flight using a radio control system.

35.0 PRODUCE AEROSPACE VEHICLES TO DEMONSTRATE THE PRINCIPLES OF FLIGHT--The student will be able to:

35.01 Identify the structural components of aircraft.
35.02 Construct flying models of lighter than air craft.
35.03 Construct flying models of kites to demonstrate the properties of lift.
35.04 Construct flying models of a glider to specific design specifications.
35.05 Construct flying models of a powered aircraft, using control surfaces to control flight characteristics of pitch, yaw and roll.
35.06 Construct a flying model of a research aircraft of ones own design.
35.07 Construct a flying model of an aircraft to demonstrate the use of radio control technology.
35.08 Design and build a model single stage rocket.
35.09 Construct a model rocket designed to carry a specific payload.
35.10 Construct a model rocket that utilizes multi staging.
35.11 Construct a model rocket launch control system.
35.12 Design and build an alternate recovery system for recovery of a rocket payload.
35.13 Design, build and test a boost glider model rocket system.
35.14 Plan, organize, and control a model rocketry contest.

36.0 DESCRIBE AND DEMONSTRATE PRINCIPLES OF NAVIGATION--The student will be able to:

36.01 Be able to describe navigation principles as they relate to aeronautical travel.
36.02 Demonstrate and ability to read and use an aeronautical navigational chart.

36.03 Examine navigational technologies and systems as they relate to aeronautical systems.
36.04 Complete a flight plan for a fixed wing aircraft, from destination to destination.
36.05 Demonstrate an understanding and application of mathematical applications as they relate to determining space flight mechanics.
36.06 Demonstrate an ability to compute a space flight orbit.
36.07 Define geostationary, polar and sunsynchronous orbits.

37.0 DEMONSTRATE APPROPRIATE SKILLS IN ANALYZING AND EVALUATING TECHNOLOGICAL ADVANCEMENTS AS REPORTED BY THE MEDIA--The student will be able to:

37.01 Distinguish between verifying facts and claims.
37.02 Determine reliability sources.
37.03 Determine accuracy of source.
37.04 Detecting bias.
37.05 Identify stated and unstated assumptions.
37.06 Recognizing logical inconsistencies.

Program: 8600600 Technology Applications II

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600610
Course Title: Technology Studies II
Course Credit: 1

COURSE DESCRIPTION:

This program provides students with an introduction to the knowledge, human relations, and technological skills found today in technical professions.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies. .
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  - integers, fractions, and decimals;
  - ratios, proportions, and percentages;
  - roots and powers;
  - algebra;
  - geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 DEMONSTRATE KNOWLEDGE OF THE BASIC PRINCIPLES OF TECHNOLOGY, THE BASIC ELEMENTS OF ALL SYSTEMS, AND THE COMPONENTS OF EACH BASIC ELEMENT--The student will be able to:

12.01 Define the six basic principles of technology: force, work, rate, resistance, energy, and power.
12.02 Name and define the three basic elements of all systems.
12.03 Name components of the three basic elements of a systems.
12.04 Name the six basic parts of the energy system.
12.05 State the function of each of the basic parts of the energy system.
12.06 Name and explain the functions of the four common working energy systems: mechanical, electrical, fluid, and thermal.

13.0 DEMONSTRATE KNOWLEDGE AND PERFORM SPECIAL SKILLS UNIQUE TO THE PHYSICAL TECHNOLOGIES--The student will be able to:

13.01 Define the function of construction technology, energy and power technology, manufacturing technology, and transportation technology.
13.02 Describe three careers for each of the physical technologies identified in 13.01.
13.03 Identify and demonstrate the tools, processes, and materials used in construction technology.
13.04 Identify and demonstrate the equipment, processes, and materials used in energy and power technology for converting and transmitting power.
13.05 Identify and demonstrate the tools, process, and materials used in manufacturing technology to perform computer-aided manufacturing.
13.06 Identify and demonstrate various ways that people and goods are transported.
13.07 Demonstrate problem-solving skills relative to the physical technologies utilizing the techniques learned in the course.

14.0 DEMONSTRATE KNOWLEDGE AND PERFORM SPECIAL SKILLS UNIQUE TO THE INFORMATION/COMMUNICATION TECHNOLOGIES--The student will be able to:

14.01 Define the function of information processing technology, graphic communication technology, and electronic communication technology.
14.02 Describe three careers for each of the communications technologies identified in 14.01.
14.03 Identified and demonstrate the tools, processes and materials used in the information/communication technologies.
14.04 Compare and contrast different processes of communication technologies.
14.05 Demonstrate modern communication systems using sound and speech, symbols and codes, printed works, drawing and pictures.
14.06 Identify the function of information processing technology, graphic communication technology, and electronic communication technology.
14.07 Identify several telecommunication services.
14.08 Demonstrate problem-solving skills relative to the information communication technologies utilizing the techniques learned in this course.

15.0 DEMONSTRATE KNOWLEDGE AND PERFORM SPECIAL SKILLS UNIQUE TO THE BIOTECHNOLOGIES--The student will be able to:

15.01 Define the function of biotechnology, medical technology, food production technology, and agriculture technology.
15.02 Describe three careers for each of the technology areas in 15.01.
15.03 Explain the three areas into which modern biotechnology is divided.
15.04 Contrast the seven resources for biotechnology with other technologies.

15.05 Identify several impacts of biotechnology on society and the environment.
15.06 Identify the role of biotechnology in agriculture, food production, and medicine.
15.07 Identify and describe the processes used in biotechnology and the related areas of produce outputs.
15.08 Identify several outputs of biotechnology and their related biotechnologies.
15.09 Demonstrate problem-solving skills relative to biotechnology, or a related biotechnology utilizing the techniques learned in this course.

16.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF ROBOTICS TECHNOLOGY--The student will be able to:

16.01 Identify three types of robots.
16.02 State the function of effectors, sensors, controllers, and auxiliary parts in a robotics system.
16.03 Operate a robot using a teach pendant.
16.04 Program a robot using a computer to perform a specific task.
16.05 Explain three impacts of robotics on society.
16.06 Demonstrate problem-solving skills relative to robotics utilizing the techniques learned in this course.

17.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF PROGRAMMABLE CONTROLLER TECHNOLOGY--The student will be able to:

17.01 State the function of the component parts of a programmable controller.
17.02 List several advantages of using programmable controllers.
17.03 Demonstrate logical continuity and branching functions with a programmable controller.

18.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF PROGRAMMABLE CONTROLLER TECHNOLOGY--The student will be able to:

18.01 Demonstrate the technique of computer numerical control to perform and engraving and a milling activity.
18.02 Demonstrate problem-solving skills relative to computer numerical control utilizing the techniques learned in this course.

19.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF COMPUTER-AIDED DRAFTING TECHNOLOGY--The student will be able to:

19.01 Compare and contrast computer-aided drafting with non-computer aided drafting in terms of speed consistency, neatness, and accuracy.
19.02 Demonstrate the application of a computer and software program indoing several computer-aided drawings.
19.03 Identify computer-aided drafting hardware.
19.04 Demonstrate program-solving skills relative to computer-aided drafting utilizing the techniques learned in this course.

20.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF LASER TECHNOLOGY--The student will be able to:

- 20.01 Describe five applications of lasers.
- 20.02 Perform laser experiments demonstrating knowledge of:
  - 20.02.01 Characteristics of laser light.
  - 20.02.02 Characteristics of light waves.
- 20.03 List the safety precautions that one observes when working with a laser.
- 20.04 Assemble, operate and identify the parts of a laser optics system.
- 20.05 Demonstrate the use of a laser to do measurements, transmit data, and monitor.

Program: 8600600 Technology Applications II

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600640
Course Title: Production Technology II
Course Credit: 1

COURSE DESCRIPTION:

This program provides students with an introduction to the knowledge, human relations, and technological skills found today in technical professions.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:

- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

21.0 PLAN AND PARTICIPATE IN A MASS PRODUCTION SYSTEM FOR MANUFACTURING A PRODUCT--The student will be able to:

21.01 Design jigs, fixtures, or a model system for product mass production.
21.02 Develop workable jigs, fixtures and/or a model system for product mass production.
21.03 Participate in the organized mass production of a product.
21.04 Demonstrate design/problem-solving processes.

22.0 PERFORM THE TECHNOLOGICAL PROCESSES OF SEPARATING AND FORMING MATERIALS--The student will be able to:

22.01 Perform materials-forming practices such as casting or molding, and compressing or stretching.
22.02 Perform materials separating practices such as shearing, chip removing, and other separating processes.
22.03 Demonstrate design/problem-solving processes.

23.0 UTILIZE MODERN PRODUCTION TECHNOLOGY IN THE PROCESSES OF SEPARATING, FORMING, COMBINING, FABRICATION, AND FINISHING OF MATERIALS (CAM, CNC, Robotics, Work Cells)--The student will be able to:

23.01 Design a program to be used in the separating forming and finishing of materials.
23.02 Develop and perform an operational program of forming materials.
23.03 Develop and perform an operational program of finishing materials.
23.04 Develop and perform an operational program that will use combination of production processes and materials.
23.05 Demonstrate design/problem-solving processes.

24.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON A PRODUCTION TECHNOLOGY SYSTEM--The student will be able to:

24.01 Identify a problem.
24.02 State a need to research the problem.
24.03 Form a hypothesis about the problem.
24.04 Plan the procedures for researching the problem.
24.05 Conduct the research following the planned procedures.
24.06 Present the research findings in a seminar.
24.07 State conclusions based on the research findings.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600670
Course Title: Engineering Technology II
Course Credit: 1

COURSE DESCRIPTION:

This program provides students with an introduction to the knowledge, human relations, and technological skills found today in technical professions.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

BEST COPY AVAILABLE

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  - integers, fractions, and decimals;
  - ratios, proportions, and percentages;
  - roots and powers;

- algebra;
- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.

07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

25.0 DISCUSS ENGINEERING TECHNOLOGY CAREERS AND PRACTICES--The student will be able to:

25.01 Summarize the professional characteristics of engineers.
25.02 List the principal fields for specialization in engineering.
25.03 Describe the procedures for becoming a registered engineer in Florida.
25.04 Describe the procedures for becoming a certified engineering technician.

25.05 Outline the typical steps to follow to prepare for a course of study leading to an engineering career.

26.0 DEMONSTRATE ENGINEERING ANALYSIS AND DESIGN METHODS--The student will be able to:

26.01 Define the terms: analysis, design, and application.
26.02 Define the experimental method as it is applied to design.
26.03 Describe methodology.
26.04 Describe simulation.
26.05 Prepare a model of a design solution to an engineering problem.
26.06 Prepare a graphical solution to an engineering problem.
26.07 Prepare a mathematical solution to an engineering problem (using either a calculator or computer).

27.0 DEMONSTRATE THE ENGINEERING DESIGN REPORTING PROCESS AS A TEAM EFFORT AND INDIVIDUALLY--The student will be able to:

27.01 Research an engineering acheivement and prepare a model, or display.
27.02 Deliver a short oral briefing which explains a technical device, process or achievement.
27.03 As a team, present a technical report on an engineering design problem, concept or issue.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600680
Course Title: Aerospace Technology II
Course Credit: 1

COURSE DESCRIPTION:

This program provides students with an introduction to the knowledge, human relations, and technological skills found today in technical professions.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

28.0 DEMONSTRATE TECHNICAL KNOWLEDGE OF CAD AS IT IS RELATED TO PRODUCING PLANS FOR AEROSPACE PROJECTS--The student will be able to:

28.01 Demonstrate the application of a computer and software program to develop a plan for an aerospace vehicle.
28.02 Demonstrate problem solving skills relative to computer aided drafting utilizing the techniques learned in this course.

29.0 DEMONSTRATE AN APPLICATION OF CAM AS IT RELATES TO MANUFACTURING PROCESSES FOR AEROSPACE TECHNOLOGY PROJECTS--The student will be able to:

29.01 Demonstrate an ability to perform a milling, engraving or turning operation utilizing a computer assisted manufacturing program.
29.02 Demonstrate problem solving skills relative to computer assisted manufacturing utilizing the techniques learned in this course.

30.0 DEMONSTRATE A BASIC UNDERSTANDING OF ELECTRICAL, MECHANICAL, FLUID AND PNEUMATIC SYSTEMS THAT COULD BE USED ON/IN AEROSPACE ENVIRONMENTS--The student will be able to:

30.01 Demonstrate the concepts of force, work, rate, resistance, energy and power through the use of various mechanical sub systems to include: gears, belts, valves, chains, pulleys, screws, cams, linkages, rods, and sprockets or mechanical trainers.
30.02 Demonstrate the concepts of force, work rate, resistance, and power through the use of various fluid subsystems to include: fluid manometers, hydraulic lifts, pipes, valves, tanks, air gauges of hydraulic trainers, and pneumatic trainers.
30.03 Demonstrate the concepts of force, work, rate, resistance, energy, and power through the use of various electrical sub systems to include: conductors, control elements, electrical loads, voltage sources, current sources, circuits, components, and measurement equipment, or electrical/electronic trainers.
30.04 Demonstrate problem solving skills relative to electrical, mechanical or fluid systems related to aerospace technology experiments.

31.0 DEMONSTRATE A KNOWLEDGE OF ROBOTICS--The student will be able to:

31.01 Identify three types of robots.
31.02 State the function of effectors, sensors, controllers, and auxiliary parts in robotics system.
31.03 Program a robot using computer to perform a specific task using machine language.
31.04 Explain how robotics technology is used in the space program.
31.05 Demonstrate problem solving skills using robotics technology as it applies to aerospace technology experiments and programs.
31.06 Forecast how robotics technology will be used in the exploration of space, space colonization or interplanetary space travel.

32.0 DEMONSTRATE A KNOWLEDGE OF COMPUTER CONTROL TECHNOLOGY--The student will be able to:

32.01 Write programs in Logo Computer Language.
32.02 Demonstrate an ability to develop programs to control simple machines using Logo programming language.

33.0 PERFORM PROCESSING SKILLS ON MATERIALS AND COMPOSITES AS THEY RELATE TO AEROSPACE TECHNOLOGY--The student will be able to:

33.01 Identify tools, machines and equipment in the laboratory and explain their functions.
33.02 Select appropriate tools, machines and equipment to accomplish a given task.
33.03 Demonstrate safe and correct use of tools, machines and equipment.
33.04 Identify various industrial raw materials.
33.05 Identify and explain the composition of composite materials.
33.06 Perform processing skills on materials and composites as needed to develop aerospace vehicles, models experimental fixtures and apparatus.

34.0 DEVELOP TEST PROCEDURES FOR MEASURING AND TESTING HUMAN PERFORMANCE IN AEROSPACE ENVIRONMENTS--The student will be able to:

34.01 Construct human data charts to determine the variation in body dimensions of human subjects.
34.02 Evaluate products and fixtures used in aerospace environments and assess their suitability for human use.
34.03 Construct human manikins for use in determining human size as related to aerospace environments.
34.04 Develop test procedures for measuring human performance including but not limited to: visual perception, ability to withstand stress, ability to live in a restricted environment, requirements for nutrition, exercise and other physical needs as may be determined by research and development of aerospace projects.
34.05 Demonstrate an ability to control an aircraft in flight by using a computer flight simulator.
34.06 Demonstrate an ability to control an aircraft in flight using a radio control system.

35.0 PRODUCE AEROSPACE VEHICLES TO DEMONSTRATE THE PRINCIPLES OF FLIGHT--The student will be able to:

35.01 Identify the structural components of aircraft.
35.02 Construct flying models of lighter than air craft.
35.03 Construct flying models of kites to demonstrate the properties of lift.
35.04 Construct flying models of a glider to specific design specifications.
35.05 Construct flying models of a powered aircraft, using control surfaces to control flight characteristics of pitch, yaw and roll.
35.06 Construct a flying model of a research aircraft of ones own design.
35.07 Construct a flying model of an aircraft to demonstrate the use of radio control technology.
35.08 Design and build a model single stage rocket.
35.09 Construct a model rocket designed to carry a specific payload.
35.10 Construct a model rocket that utilizes multi staging.
35.11 Construct a model rocket launch control system.
35.12 Design and build an alternate recovery system for recovery of a rocket payload.

35.13 Design, build and test a boost glider model rocket system.
35.14 Plan, organize, and control a model rocketry contest.

36.0 DESCRIBE AND DEMONSTRATE PRINCIPLES OF NAVIGATION--The student will be able to:

36.01 Be able to describe navigation principles as they relate to aeronautical travel.
36.02 Demonstrate and ability to read and use an aeronautical navigational chart.
36.03 Examine navigational technologies and systems as they relate to aeronautical systems.
36.04 Complete a flight plan for a fixed wing aircraft, from destination to destination.
36.05 Demonstrate an understanding and application of mathematical applications as they relate to determining space flight mechanics.
36.06 Demonstrate an ability to compute a space flight orbit.
36.07 Define geostationary, polar and sunsynchronous orbits.

37.0 DEMONSTRATE APPROPRIATE SKILLS IN ANALYZING AND EVALUATING TECHNOLOGICAL ADVANCEMENTS AS REPORTED BY THE MEDIA--The student will be able to:

37.01 Distinguish between verifying facts and claims.
37.02 Determine reliability sources.
37.03 Determine accuracy of source.
37.04 Detecting bias.
37.05 Identify stated and unstated assumptions.
37.06 Recognizing logical inconsistencies.

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Technology Applications III
Occupational Area:	Technology Education
	Secondary
Program Numbers	**8601700**
CIP Number	0821.011300
Grade Level	9-12, 30, 31
Length	4 credits
Certification	INDUS ARTS @4 @6 I ART-TEC 1 @2

I. **MAJOR CONCEPTS/CONTENT:** The purpose of this program is to provide students with a foundation of knowledge and technically oriented experiences in the study of the applications of technology and its effect upon our lives and the choosing of an occupation. The content and activities will also include the study of entrepreneurship, safety, and leadership skills. This program focuses on transferable skills and stresses understanding and demonstration of the technological tolls, machines, instruments, materials, processes and systems in business and industry.

The content includes advanced studies in areas of technology which include Technology Studies, Production, Engineering and Aerospace.

Listed below are the level III courses in the Technology Applications I thru III sequence offered at secondary schools followed by the laboratory design codes appropriate for the courses.

8601710 - Technology Studies III (243)
8601740 - Production Technology III (243)
8601770 - Engineering Technology III (243)
8601780 - Aerospace Technology III (243)

II. **LABORATORY ACTIVITIES:** Instruction and learning activities are provided in a laboratory setting using hands-on experiences with technology equipment, tools and materials appropriate to the course content.

III. **SPECIAL NOTE:** The Florida Technology Student Association (FL-TSA) is the appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. Vocational student organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Please note that the courses listed in this program may articulate into postsecondary Tech-Prep 2 + 2 programs when combined with a corresponding course listed under TECHNOLOGY APPLICATIONS II. Tech-Prep

2 + 2 programs require articulation agreements between secondary and post-secondary educational agencies.

In accordance with HB 2489 - Section 42, approved by the Florida Legislature and signed into law June 16, 1995, Technology Education students who have completed a minimum of three sequential credits in an eligible technology education program by the end of school year 1995-96 and thereafter will be eligible for the Gold Seal designation. The student must also continue in a planned, related post secondary education program.

IV. **INTENDED OUTCOMES:** After successfully completing this course the student will be able to:

01.0 Demonstrate the ability to work safely with a variety of technologies.
02.0 Demonstrate interpersonal skills as they relate to the workplace.
03.0 Identify and apply methods of information acquisition and utilization.
04.0 Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05.0 Demonstrate and apply design/problem-solving processes.
06.0 Express an understanding of technological systems and their complex interrelationships.
07.0 Demonstrate the ability to properly identify, organize, plan, and allocate resources.
08.0 Discuss individual interests and aptitudes as they relate to a career.
09.0 Demonstrate employability skills.
10.0 Demonstrate an understanding of entrepreneurship.
11.0 Make an informed and meaningful career choice.
12.0 Demonstrate knowledge and application of mechanical systems.
13.0 Demonstrate knowledge and application of fluid systems.
14.0 Demonstrate knowledge and application of electrical systems.
15.0 Demonstrate the use of fiber optics.
16.0 Demonstrate the use of a computer to integrate and control a system composed of mechanical, fluid and electrical systems.
17.0 Conduct a research and experimentation project on a technological material or process.
18.0 Demonstrate technological knowledge and skills in the designing and engineering of constructed works.
19.0 Demonstrate technical knowledge and skills in the contracting, estimating, bidding, and scheduling procedures processes.
20.0 Demonstrate technical knowledge and skill in the construction of superstructures.
21.0 Demonstrate technical knowledge and skills in the installation of utilities.
22.0 Demonstrate technical knowledge and skills in the processes of enclosing superstructures.
23.0 Demonstrate technical knowledge and skills in the process of finishing the interior and exterior of a constructed structure.
24.0 Conduct a research and experimentation project on a production technology system.

25.0 Demonstrate and apply mechanical, fluid, electrical and thermal system principles.
26.0 Demonstrate a knowledge of materials and processes.
27.0 Use tools, machines, calculators, and computers necessary for obtaining solutions to design problems.
28.0 Describe the functional characteristics of the engineering design team.
29.0 Conduct a research and experimentation or design project on engineering technology.
30.0 Demonstrate technical knowledge of CAD as it relates to producing plans for aerospace projects.
31.0 Demonstrate an application of CAM as it relates to manufacturing processes for aerospace technology projects.
32.0 Demonstrate an understanding of electrical, mechanical, fluid, and pneumatic systems that could be used on/in space environments.
33.0 Demonstrate a knowledge of robotics.
34.0 Demonstrate a knowledge of computer control technology.
35.0 Perform processing skills on materials and composites as they relate to aerospace technology.
36.0 Utilize test facilities and equipment to determine suitability of materials and processes in an aerospace.
37.0 Develop test procedures for measuring and testing human performance in aerospace environments.
38.0 Demonstrate an understanding of the effects of flight as it relates to biotechnology.
39.0 Conduct a research and experimentation project related to aerospace technology.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Technology Applications III
Secondary Number: 8601700
Postsecondary Number:

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.

03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.

04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.

08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF MECHANICAL SYSTEMS--The student will be able to:

12.01 Define the concepts of force, work, rate, resistance, energy and power as they relate to mechanical systems.
12.02 Diagram a mechanical system incorporating input, monitoring, controlling, output, and feedback.
12.03 Report on the six simple machines.
12.04 Identify various parts of a mechanical system.
12.05 Assemble and operate the six simple machines.
12.06 Use the problem-solving model - perform activities using combinations of the six simple machines to meet the described design criteria.
12.07 Demonstrate the use of a computer to control a mechanical system.

13.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF FLUID SYSTEMS--The student will be able to:

13.01 Define the concepts of force, work rate, resistance, energy and power as they relate to fluid systems.
13.02 Diagram a fluid system incorporating input, monitoring, controlling, output, and feedback.
13.03 Diagram a fluid power system incorporating input, monitoring, controlling, output, and feedback.
13.04 Use the problem-solving model - perform activities using fluid power components to meet the described design criteria.
13.05 Assemble, operate, and identify the parts of a fluid power system.
13.06 Report on the applications of fluid power used in technology.
13.07 Demonstrate the use of a computer to control a fluid power system.

14.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF ELECTRICAL SYSTEMS--The student will be able to:

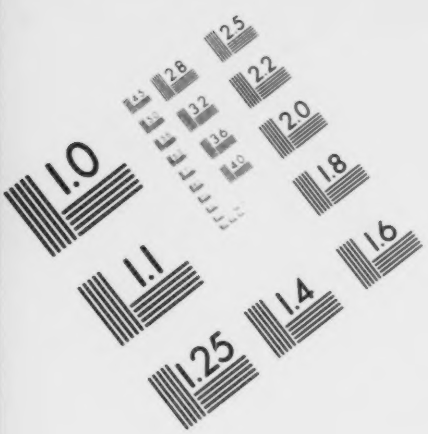
14.01 Define the concepts of force, work, rate resistance, energy, and power as they relate to electrical systems.
14.02 Diagram an electrical system incorporating input, monitoring, controlling, output and feedback components.
14.03 Explain what a system and sub-system is.
14.04 Describe types of electrical outputs of heat, light, temperature, sound, magnetism, and electrical voltage.
14.05 Describe types of electrical inputs of light, temperature, sound, magnetism, moisture, movement, pressure, and voltage.
14.06 Use the problem-solving model - perform activities using electrical system components to meet the describe design criteria.
14.07 Demonstrate the use of a computer to control an electrical system.

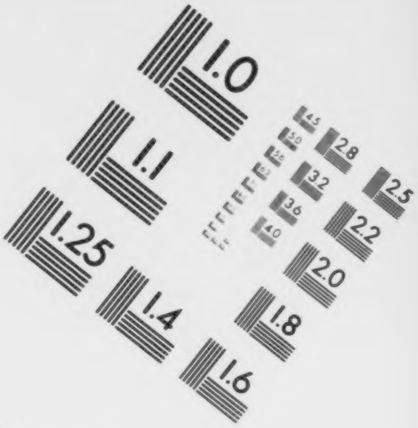
15.0 DEMONSTRATE THE USE OF FIBER OPTICS--The student will be able to:

15.01 Report on the applications of fiber optics in technology.
15.02 Use the problem-solving model - perform activities using fiber optics to meet the described design criteria.
15.03 Assemble, operate, and identify the parts of a fiber optics systems.

16.0 DEMONSTRATE THE USE OF A COMPUTER TO INTEGRATE AND CONTROL A SYSTEM COMPOSED OF MECHANICAL, FLUID AND ELECTRICAL SYSTEMS--The student will be able to:

16.01 Diagram an integrated system incorporating input, monitoring, controlling, output and feedback components.
16.02 Use the problem-solving model - perform activities using integrated systems to meet the described design criteria.
16.03 Assemble, operate, and identify the parts of integrated systems.
16.04 Demonstrate the use of a computer to control an integrated system composed of mechanical, fluid and electrical components.





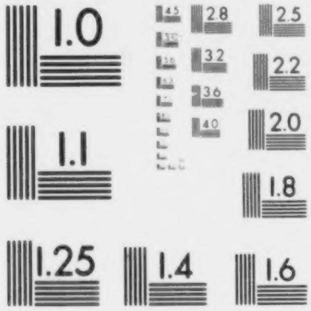
AIIM

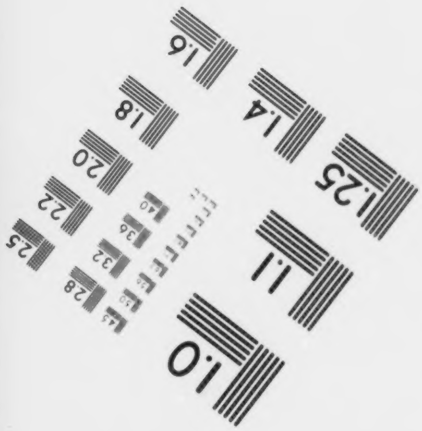
Association for Information and Image Management

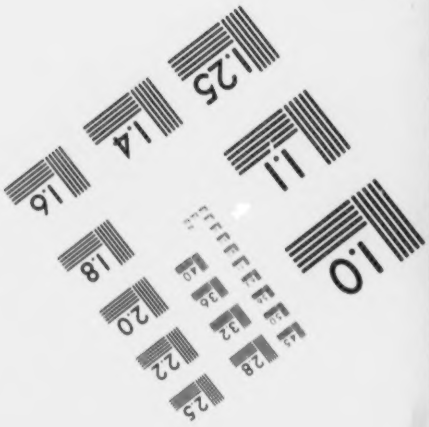
1100 Wayne Avenue, Suite 1100
Silver Spring, Maryland 20910

301/587-8202

Centimeter
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
mm
1
2
3
4
5
Inches


1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5





MANUFACTURED TO AIIM STANDARDS
BY APPLIED IMAGE, INC.

17.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON A TECHNOLOGICAL MATERIAL OR PROCESS--The student will be able to:

17.01 Identify a problem.
17.02 State a need to research the problem.
17.03 Form a hypothesis about the problem.
17.04 Plan the procedures for researching the problem.
17.05 Conduct the research following the planned procedures.
17.06 Present the research findings in a seminar.
17.07 State conclusions based on the research findings.

18.0 DEMONSTRATE TECHNOLOGICAL KNOWLEDGE AND SKILLS IN THE DESIGNING AND ENGINEERING OF CONSTRUCTED WORKS--The student will be able to:

18.01 Read and interpret architectural drawings, blueprints, symbols, and construction plans.
18.02 Describe building codes, permits, and inspection requirements.
18.03 Sketch and draw a plan for a construction project.
18.04 Display knowledge about regional planning and the construction of civil and community projects (roads, parks, dams, airports, seaports, warehouses, shopping centers, factories, skyscrapers, etc.).
18.05 Develop a scale model of a civil or community structure and give a report on the need.

19.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE CONTRACTING, ESTIMATING, BIDDING, AND SCHEDULING PROCEDURES PROCESSES--The student will be able to:

19.01 Estimate construction costs using various methods including a computer.
19.02 Read and prepare bid invitations for contractors to build a construction project.
19.03 Establish criteria for awarding a construction contract.
19.04 Describe the content of a construction contract and performance bond.

20.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE CONSTRUCTION OF SUPERSTRUCTURES--The student will be able to:

20.01 Describe mass, solid wall, frame, and air-supported superstructures.
20.02 Describe the materials used in the construction of superstructures.
20.03 Use technical carpentry skills, tools, and materials in constructing a wood frame superstructure.
20.04 Describe factory manufacturing of superstructures and modules.

21.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE INSTALLATION OF UTILITIES--The student will be able to:

21.01 Describe public utility systems for supplying water, electricity, natural gas, and sewerage.

BEST COPY AVAILABLE

21.02 Describe the functions and operation of heating, cooling, and ventilating systems.
21.03 Demonstration a technical knowledge of plumbing and electrical systems in homes or buildings.
21.04 Use the technical tools and skills to install plumbing and electrical systems in homes of buildings.
21.05 Diagnose and troubleshoot problems with utility systems.

22.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE PROCESS OF ENCLOSING SUPERSTRUCTURES--The student will be able to:

22.01 Describe the different types of materials and methods for constructing interior and exterior walls.
22.02 Describe the different types of materials and methods for laying floors and building roofs.
22.03 Describe the different types of methods of constructing or installing windows and doors.
22.04 Describe the purposes, materials, and methods of insulating enclosed superstructures.

23.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE PROCESS OF FINISHING THE INTERIOR AND EXTERIOR OF A CONSTRUCTED STRUCTURE--The student will be able to:

23.01 Describe the different types of materials and methods for trimming, painting, and decorating a constructed structure.
23.02 Describe the types of accessories and fixtures that are installed to finish completed construction.
23.03 Describe the materials and methods used for the finishing processes of paving and landscaping.

24.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON A PRODUCTION TECHNOLOGY SYSTEM--The student will be able to:

24.01 Identify a problem.
24.02 State a need to research the problem.
24.03 Form a hypothesis about the problem.
24.04 Plan the procedures for researching the problem.
24.05 Conduct the research following the planned procedures.
24.06 Present the research findings in a seminar.
24.07 State conclusions based on the research findings.

25.0 DEMONSTRATE AND APPLY MECHANICAL, FLUID, ELECTRICAL AND THERMAL SYSTEM PRINCIPLES--The student will be able to:

25.01 Demonstrate the design solution to a mechanical system problem.
25.02 Demonstrate the design solution to a fluid system problem.
25.03 Demonstrate the design solution to an electrical system problem.
25.04 Demonstrate the design solution to a thermal system problem.
25.05 Select materials and processes to satisfy specific design criteria.
25.06 Select a problem or product for improvement using the design methodology.

26.0 DEMONSTRATE A KNOWLEDGE OF MATERIALS AND PROCESSES--The student will be able to:

26.01 Describe the physical and chemical properties of engineering materials in terms of their structure.
26.02 List the causes of failure in materials and give procedures to prevent such failure.
26.03 Experiment with processes used with metal, woods, polymers, composite materials and adhesives.

27.0 USE TOOLS, MACHINES, CALCULATORS, AND COMPUTERS NECESSARY FOR OBTAINING SOLUTIONS TO DESIGN PROBLEMS--The student will be able to:

27.01 Demonstrate the use of various graphs to categorize and display data.
27.02 Make decisions using graphical data presentations.
27.03 Demonstrate the use of a nomograph in solving equations.
27.04 Use a numerical calculator to solve complex equations either by direct solution or iteration (trial and error).
27.05 Use a computer and applications software to solve a design problem by simulation.
27.06 Demonstrate graphical vector analysis.

28.0 DESCRIBE THE FUNCTIONAL CHARACTERISTICS OF THE ENGINEERING DESIGN TEAM--The student will be able to:

28.01 Describe work breakdown organization.
28.02 Describe work group organization schemes including functional and hierarchical schemes.
28.03 Describe the function of management in general and project management in particular.
28.04 Describe a typical design project team structure.
28.05 Outline a research methodology.
28.06 Describe brain-storming.

29.0 CONDUCT A RESEARCH AND EXPERIMENTATION OR DESIGN PROJECT ON ENGINEERING TECHNOLOGY--The student will be able to:

29.01 Identify a problem.
29.02 State a need to solve the problem.
29.03 Form a hypothesis about the problem.
29.04 Plan the procedures for solving the problem.
29.05 Complete the solution following the planned procedures.
29.06 Present the findings in a seminar.
29.07 State conclusions based on the findings.

30.0 DEMONSTRATE TECHNICAL KNOWLEDGE OF CAD AS IT IS RELATED TO PRODUCING PLANS FOR AEROSPACE PROJECTS--The student will be able to:

30.01 Demonstrate the application of a computer and software program to develop a plan for an aerospace vehicle.
30.02 Demonstrate problem solving skills relative to computer aided drafting utilizing the techniques learned in this course.

31.0 DEMONSTRATE AN APPLICATION OF CAM AS IT RELATES TO MANUFACTURING PROCESSES FOR AEROSPACE TECHNOLOGY PROJECTS--The student will be able to:

31.01 Demonstrate an ability to perform a milling, engraving or turning operation utilizing a computer assisted manufacturing program.
31.02 Demonstrate problem solving skills relative to computer assisted manufacturing utilizing the techniques learned in this course.

32.0 DEMONSTRATE A BASIC UNDERSTANDING OF ELECTRICAL, MECHANICAL, FLUID AND PNEUMATIC SYSTEMS THAT COULD BE USED ON/IN AEROSPACE ENVIRONMENTS--The student will be able to:

32.01 Demonstrate the concepts of force, work, rate, resistance, energy and power through the use of various mechanical sub systems to include: gears, belts, valves, chains, pulleys, screws, cams, linkages, rods, and sprockets or mechanical trainers.
32.02 Demonstrate the concepts of force, work rate, resistance, and power through the use of various fluid subsystems to include: fluid manometers, hydraulic lifts, pipes, valves, tanks, air gauges of hydraulic trainers, and pneumatic trainers.
32.03 Demonstrate the concepts of force, work, rate, resistance, energy, and power through the use of various electrical sub systems to include: conductors, control elements, electrical loads, voltage sources, current sources, circuits, components, and measurement equipment, or electrical/electronic trainers.
32.04 Demonstrate problem solving skills relative to electrical, mechanical or fluid systems related to aerospace technology experiments.

33.0 DEMONSTRATE A KNOWLEDGE OF ROBOTICS--The student will be able to:

33.01 Identify three types of robots.
33.02 State the function of effectors, sensors, controllers, and auxiliary parts in robotics system.
33.03 Program a robot using computer to perform a specific task using machine language.
33.04 Explain how robotics technology is used in the space program.
33.05 Demonstrate problem solving skills using robotics technology as it applies to aerospace technology experiments and programs.
33.06 Forecast how robotics technology will be used in the exploration of space, space colonization or interplanetary space travel.

34.0 DEMONSTRATE A KNOWLEDGE OF COMPUTER CONTROL TECHNOLOGY--The student will be able to:

34.01 Write programs in Logo Computer Language.
34.02 Demonstrate an ability to develop programs to control simple machines using Logo programming language.

35.0 PERFORM PROCESSING SKILLS ON MATERIALS AND COMPOSITES AS THEY RELATE TO AEROSPACE TECHNOLOGY--The student will be able to:

35.01 Identify tools, machines and equipment in the laboratory and explain their functions.
35.02 Select appropriate tools, machines and equipment to accomplish a given task.
35.03 Demonstrate safe and correct use of tools, machines and equipment.
35.04 Identify various industrial raw materials.
35.05 Identify and explain the composition of composite materials.
35.06 Perform processing skills on materials and composites as needed to develop aerospace vehicles, models experimental fixtures and apparatus.

36.0 UTILIZE TEST FACILITIES AND EQUIPMENT TO DETERMINE SUITABILITY OF MATERIALS AND PROCESSES TO AN AEROSPACE ENVIRONMENT--The student will be able to:

36.01 Use appropriate test instruments, equipment and machines to test materials and processes for strength, compressibility, heat retention, insulating properties, conductivity or other properties as necessary to the solution of aerospace design and engineering problems.
36.02 Use test apparatus to conduct testing of processes, procedures and equipment developed in design and engineering problems.
36.03 Demonstrate problem solving using test equipment, machines and instruments to determine suitability of materials and processes developed in research and development activities of aerospace engineering problems.
36.04 Explain the requirements of the aerospace industry for quality control and testing of materials and processes as it relates to product development, safety and performance of aerospace products, and vehicles.

37.0 DEVELOP TEST PROCEDURES FOR MEASURING AND TESTING HUMAN PERFORMANCE IN AEROSPACE ENVIRONMENTS--The student will be able to:

37.01 Construct human data charts to determine the variation in body dimensions of human subjects.
37.02 Evaluate products and fixtures used in aerospace environments and assess their suitability for human use.
37.03 Construct human manikins for use in determining human size as related to aerospace environments.
37.04 Develop test procedures for measuring human performance including but not limited to: visual perception, ability to withstand stress, ability to live in a restricted environment, requirements for nutrition, exercise and other physical needs as may be determined by research and development of aerospace projects.
37.05 Demonstrate an ability to control an aircraft in flight by using a computer flight simulator.

37.06 Demonstrate an ability to control an aircraft in flight using a radio control system.

38.0 DEMONSTRATE AN UNDERSTANDING OF THE EFFECTS OF FLIGHT AS IT RELATES TO BIOTECHNOLOGY--The student will be able to:

38.01 Demonstrate the effects of living in space on plant and animal organisms.
38.02 Plan and build model space craft to demonstrate possible solutions to space travel, extended space living quarters, and providing a living space environment for human exploration of the universe.
38.03 Plan and produce a model system for providing life support systems for space travel.
38.04 Research the biological effects of extended space flight.
38.05 Participate in a space flight simulation.

39.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT RELATED TO AEROSPACE TECHNOLOGY--The student will be able to:

39.01 Identify a problem.
39.02 State a need to research the problem.
39.03 Form a hypothesis about the problem.
39.04 Plan the procedures for researching the problem.
39.05 Conduct the research following the planned procedures.
39.06 Present the research findings in a seminar.
39.07 State conclusions based on the research findings.

Program: 8601700 Technology Applications III

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8601710
Course Title: Technology Studies III
Course Credit: 1

COURSE DESCRIPTION:

This program provides students with an introduction to the knowledge, human relations, and technological skills found today in technical profession.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  - integers, fractions, and decimals;
  - ratios, proportions, and percentages;
  - roots and powers;
  - algebra;
  - geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.

04.16 Use elementary concepts of probability and statistics.

04.17 Draw, read, and analyze graphs, charts, and tables.

04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.

04.19 Organize and communicate the results obtained by observation and experimentation.

04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).

04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.

05.03 Design and implement the optimal solution to a given problem.

05.04 Document each step of the design/problem-solving process.

05.05 Demonstrate "brainstorming" as a process to solve problems.

05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.

06.02 Explore methods used to monitor and correct performance of technological systems.

06.03 Design and implement an optimal solution to a given problem.

06.04 Outline major historical technological developments or events.

06.05 Identify recent advances in technology.

06.06 Explain problem-solving roles of technology.

06.07 Forecast a technological development or event.

06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.

07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.

07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.

07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF MECHANICAL SYSTEMS--The student will be able to:

12.01 Define the concepts of force, work, rate, resistance, energy and power as they relate to mechanical systems.
12.02 Diagram a mechanical system incorporating input, monitoring, controlling, output, and feedback.
12.03 Report on the six simple machines.
12.04 Identify various parts of a mechanical system.
12.05 Assemble and operate the six simple machines.
12.06 Use the problem-solving model - perform activities using combinations of the six simple machines to meet the described design criteria.

12.07 Demonstrate the use of a computer to control a mechanical system.

13.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF FLUID SYSTEMS--The student will be able to:

13.01 Define the concepts of force, work rate, resistance, energy and power as they relate to fluid systems.
13.02 Diagram a fluid system incorporating input, monitoring, controlling, output, and feedback.
13.03 Diagram a fluid power system incorporating input, monitoring, controlling, output, and feedback.
13.04 Use the problem-solving model - perform activities using fluid power components to meet the described design criteria.
13.05 Assemble, operate, and identify the parts of a fluid power system.
13.06 Report on the applications of fluid power used in technology.
13.07 Demonstrate the use of a computer to control a fluid power system.

14.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF ELECTRICAL SYSTEMS--The student will be able to:

14.01 Define the concepts of force, work, rate resistance, energy, and power as they relate to electrical systems.
14.02 Diagram an electrical system incorporating input, monitoring, controlling, output and feedback components.
14.03 Explain what a system and sub-system is.
14.04 Describe types of electrical outputs of heat, light, temperature, sound, magnetism, and electrical voltage.
14.05 Describe types of electrical inputs of light, temperature, sound, magnetism, moisture, movement, pressure, and voltage.
14.06 Use the problem-solving model - perform activities using electrical system components to meet the describe design criteria.
14.07 Demonstrate the use of a computer to control an electrical system.

15.0 DEMONSTRATE THE USE OF FIBER OPTICS--The student will be able to:

15.01 Report on the applications of fiber optics in technology.
15.02 Use the problem-solving model - perform activities using fiber optics to meet the described design criteria.
15.03 Assemble, operate, and identify the parts of a fiber optics systems.

16.0 DEMONSTRATE THE USE OF A COMPUTER TO INTEGRATE AND CONTROL A SYSTEM COMPOSED OF MECHANICAL, FLUID AND ELECTRICAL SYSTEMS--The student will be able to:

16.01 Diagram an integrated system incorporating input, monitoring, controlling, output and feedback components.
16.02 Use the problem-solving model - perform activities using integrated systems to meet the described design criteria.

16.03 Assemble, operate, and identify the parts of integrated systems.
16.04 Demonstrate the use of a computer to control an integrated system composed of mechanical, fluid and electrical components.

17.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON A TECHNOLOGICAL MATERIAL OR PROCESS--The student will be able to:

17.01 Identify a problem.
17.02 State a need to research the problem.
17.03 Form a hypothesis about the problem.
17.04 Plan the procedures for researching the problem.
17.05 Conduct the research following the planned procedures.
17.06 Present the research findings in a seminar.
17.07 State conclusions based on the research findings.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8601740
Course Title: Production Technology III
Course Credit: 1

COURSE DESCRIPTION:

This program provides students with an introduction to the knowledge, human relations, and technological skills found today in technical profession.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  - integers, fractions, and decimals;
  - ratios, proportions, and percentages;
  - roots and powers;
  - algebra;
  - geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.

04.16 Use elementary concepts of probability and statistics.

04.17 Draw, read, and analyze graphs, charts, and tables.

04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.

04.19 Organize and communicate the results obtained by observation and experimentation.

04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).

04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.

05.03 Design and implement the optimal solution to a given problem.

05.04 Document each step of the design/problem-solving process.

05.05 Demonstrate "brainstorming" as a process to solve problems.

05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.

06.02 Explore methods used to monitor and correct performance of technological systems.

06.03 Design and implement an optimal solution to a given problem.

06.04 Outline major historical technological developments or events.

06.05 Identify recent advances in technology.

06.06 Explain problem-solving roles of technology.

06.07 Forecast a technological development or event.

06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.

07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.

07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.

07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

18.0 DEMONSTRATE TECHNOLOGICAL KNOWLEDGE AND SKILLS IN THE DESIGNING AND ENGINEERING OF CONSTRUCTED WORKS--The student will be able to:

18.01 Read and interpret architectural drawings, blueprints, symbols, and construction plans.
18.02 Describe building codes, permits, and inspection requirements.
18.03 Sketch and draw a plan for a construction project.
18.04 Display knowledge about regional planning and the construction of civil and community projects (roads, parks, dams, airports, seaports, warehouses, shopping centers, factories, skyscrapers, etc.).
18.05 Develop a scale model of a civil or community structure and give a report on the need.

19.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE CONTRACTING, ESTIMATING, BIDDING, AND SCHEDULING PROCEDURES PROCESSES--The student will be able to:

19.01 Estimate construction costs using various methods including a computer.
19.02 Read and prepare bid invitations for contractors to build a construction project.
19.03 Establish criteria for awarding a construction contract.
19.04 Describe the content of a construction contract and performance bond.

20.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE CONSTRUCTION OF SUPERSTRUCTURES--The student will be able to:

20.01 Describe mass, solid wall, frame, and air-supported superstructures.
20.02 Describe the materials used in the construction of superstructures.
20.03 Use technical carpentry skills, tools, and materials in constructing a wood frame superstructure.
20.04 Describe factory manufacturing of superstructures and modules.

21.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE INSTALLATION OF UTILITIES--The student will be able to:

21.01 Describe public utility systems for supplying water, electricity, natural gas, and sewerage.
21.02 Describe the functions and operation of heating, cooling, and ventilating systems.
21.03 Demonstration a technical knowledge of plumbing and electrical systems in homes or buildings.
21.04 Use the technical tools and skills to install plumbing and electrical systems in homes of buildings.
21.05 Diagnose and troubleshoot problems with utility systems.

22.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE PROCESS OF ENCLOSING SUPERSTRUCTURES--The student will be able to:

22.01 Describe the different types of materials and methods for constructing interior and exterior walls.
22.02 Describe the different types of materials and methods for laying floors and building roofs.
22.03 Describe the different types of methods of constructing or installing windows and doors.
22.04 Describe the purposes, materials, and methods of insulating enclosed superstructures.

23.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE PROCESS OF FINISHING THE INTERIOR AND EXTERIOR OF A CONSTRUCTED STRUCTURE--The student will be able to:

23.01 Describe the different types of materials and methods for trimming, painting, and decorating a constructed structure.
23.02 Describe the types of accessories and fixtures that are installed to finish completed construction.
23.03 Describe the materials and methods used for the finishing processes of paving and landscaping.

24.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON A PRODUCTION TECHNOLOGY SYSTEM--The student will be able to:

24.01 Identify a problem.
24.02 State a need to research the problem.
24.03 Form a hypothesis about the problem.
24.04 Plan the procedures for researching the problem.
24.05 Conduct the research following the planned procedures.
24.06 Present the research findings in a seminar.
24.07 State conclusions based on the research findings.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8601770
Course Title: Engineering Technology III
Course Credit: 1

COURSE DESCRIPTION:

This program provides students with an introduction to the knowledge, human relations, and technological skills found today in technical profession.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.

03.02 Identify and describe methods of information acquisition and evalution.

03.03 Discuss advantages and disadvantages in the application of technologies.

03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.

03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.

04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.

04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.

04.04 Distinguish fact from opinion.

04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.

04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.

04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.

04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.

04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.

04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.

04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.

04.14 Use the mathematics of:

- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

25.0 DEMONSTRATE AND APPLY MECHANICAL, FLUID, ELECTRICAL AND THERMAL SYSTEM PRINCIPLES--The student will be able to:

25.01 Demonstrate the design solution to a mechanical system problem.
25.02 Demonstrate the design solution to a fluid system problem.
25.03 Demonstrate the design solution to an electrical system problem.
25.04 Demonstrate the design solution to a thermal system problem.
25.05 Select materials and processes to satisfy specific design criteria.
25.06 Select a problem or product for improvement using the design methodology.

BEST COPY AVAILABLE

26.0 DEMONSTRATE A KNOWLEDGE OF MATERIALS AND PROCESSES--The student will be able to:

26.01 Describe the physical and chemical properties of engineering materials in terms of their structure.
26.02 List the causes of failure in materials and give procedures to prevent such failure.
26.03 Experiment with processes used with metal, woods, polymers, composite materials and adhesives.

27.0 USE TOOLS, MACHINES, CALCULATORS, AND COMPUTERS NECESSARY FOR OBTAINING SOLUTIONS TO DESIGN PROBLEMS--The student will be able to:

27.01 Demonstrate the use of various graphs to categorize and display data.
27.02 Make decisions using graphical data presentations.
27.03 Demonstrate the use of a nomograph in solving equations.
27.04 Use a numerical calculator to solve complex equations either by direct solution or iteration (trial and error).
27.05 Use a computer and applications software to solve a design problem by simulation.
27.06 Demonstrate graphical vector analysis.

28.0 DESCRIBE THE FUNCTIONAL CHARACTERISTICS OF THE ENGINEERING DESIGN TEAM--The student will be able to:

28.01 Describe work breakdown organization.
28.02 Describe work group organization schemes including functional and hierarchical schemes.
28.03 Describe the function of management in general and project management in particular.
28.04 Describe a typical design project team structure.
28.05 Outline a research methodology.
28.06 Describe brain-storming.

29.0 CONDUCT A RESEARCH AND EXPERIMENTATION OR DESIGN PROJECT ON ENGINEERING TECHNOLOGY--The student will be able to:

29.01 Identify a problem.
29.02 State a need to solve the problem.
29.03 Form a hypothesis about the problem.
29.04 Plan the procedures for solving the problem.
29.05 Complete the solution following the planned procedures.
29.06 Present the findings in a seminar.
29.07 State conclusions based on the findings.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8601780
Course Title: Aerospace Technology III
Course Credit: 1

COURSE DESCRIPTION:

This program provides students with an introduction to the knowledge, human relations, and technological skills found today in technical profession.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.

03.02 Identify and describe methods of information acquisition and evalution.

03.03 Discuss advantages and disadvantages in the application of technologies.

03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.

03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.

04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.

04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.

04.04 Distinguish fact from opinion.

04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.

04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.

04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.

04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.

04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.

04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.

04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.

04.14 Use the mathematics of:
- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.

BEST COPY AVAILABLE

04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

30.0 DEMONSTRATE TECHNICAL KNOWLEDGE OF CAD AS IT IS RELATED TO PRODUCING PLANS FOR AEROSPACE PROJECTS--The student will be able to:

30.01 Demonstrate the application of a computer and software program to develop a plan for an aerospace vehicle.
30.02 Demonstrate problem solving skills relative to computer aided drafting utilizing the techniques learned in this course.

31.0 DEMONSTRATE AN APPLICATION OF CAM AS IT RELATES TO MANUFACTURING PROCESSES FOR AEROSPACE TECHNOLOGY PROJECTS--The student will be able to:

31.01 Demonstrate an ability to perform a milling, engraving or turning operation utilizing a computer assisted manufacturing program.
31.02 Demonstrate problem solving skills relative to computer assisted manufacturing utilizing the techniques learned in this course.

32.0 DEMONSTRATE A BASIC UNDERSTANDING OF ELECTRICAL, MECHANICAL, FLUID AND PNEUMATIC SYSTEMS THAT COULD BE USED ON/IN AEROSPACE ENVIRONMENTS--The student will be able to:

32.01 Demonstrate the concepts of force, work, rate, resistance, energy and power through the use of various mechanical sub systems to include: gears, belts, valves, chains, pulleys, screws, cams, linkages, rods, and sprockets or mechanical trainers.
32.02 Demonstrate the concepts of force, work rate, resistance, and power through the use of various fluid subsystems to include: fluid manometers, hydraulic lifts, pipes, valves, tanks, air gauges of hydraulic trainers, and pneumatic trainers.
32.03 Demonstrate the concepts of force, work, rate, resistance, energy, and power through the use of various electrical sub systems to include: conductors, control elements, electrical loads, voltage sources, current sources, circuits, components, and measurement equipment, or electrical/electronic trainers.
32.04 Demonstrate problem solving skills relative to electrical, mechanical or fluid systems related to aerospace technology experiments.

33.0 DEMONSTRATE A KNOWLEDGE OF ROBOTICS--The student will be able to:

33.01 Identify three types of robots.
33.02 State the function of effectors, sensors, controllers, and auxiliary parts in robotics system.
33.03 Program a robot using computer to perform a specific task using machine language.
33.04 Explain how robotics technology is used in the space program.
33.05 Demonstrate problem solving skills using robotics technology as it applies to aerospace technology experiments and programs.
33.06 Forecast how robotics technology will be used in the exploration of space, space colonization or interplanetary space travel.

34.0 DEMONSTRATE A KNOWLEDGE OF COMPUTER CONTROL TECHNOLOGY--The student will be able to:

34.01 Write programs in Logo Computer Language.
34.02 Demonstrate an ability to develop programs to control simple machines using Logo programming language.

35.0 PERFORM PROCESSING SKILLS ON MATERIALS AND COMPOSITES AS THEY RELATE TO AEROSPACE TECHNOLOGY--The student will be able to:

35.01 Identify tools, machines and equipment in the laboratory and explain their functions.
35.02 Select appropriate tools, machines and equipment to accomplish a given task.
35.03 Demonstrate safe and correct use of tools, machines and equipment.
35.04 Identify various industrial raw materials.
35.05 Identify and explain the composition of composite materials.
35.06 Perform processing skills on materials and composites as needed to develop aerospace vehicles, models experimental fixtures and apparatus.

36.0 UTILIZE TEST FACILITIES AND EQUIPMENT TO DETERMINE SUITABILITY OF MATERIALS AND PROCESSES TO AN AEROSPACE ENVIRONMENT--The student will be able to:

36.01 Use appropriate test instruments, equipment and machines to test materials and processes for strength, compressibility, heat retention, insulating properties, conductivity or other properties as necessary to the solution of aerospace design and engineering problems.
36.02 Use test apparatus to conduct testing of processes, procedures and equipment developed in design and engineering problems.
36.03 Demonstrate problem solving using test equipment, machines and instruments to determine suitability of materials and processes developed in research and development activities of aerospace engineering problems.
36.04 Explain the requirements of the aerospace industry for quality control and testing of materials and processes as it relates to product development, safety and performance of aerospace products, and vehicles.

37.0 DEVELOP TEST PROCEDURES FOR MEASURING AND TESTING HUMAN PERFORMANCE IN AEROSPACE ENVIRONMENTS--The student will be able to:

37.01 Construct human data charts to determine the variation in body dimensions of human subjects.
37.02 Evaluate products and fixtures used in aerospace environments and assess their suitability for human use.
37.03 Construct human manikins for use in determining human size as related to aerospace environments.
37.04 Develop test procedures for measuring human performance including but not limited to: visual perception, ability to withstand stress, ability to live in a restricted environment, requirements for nutrition, exercise and other physical needs as may be determined by research and development of aerospace projects.
37.05 Demonstrate an ability to control an aircraft in flight by using a computer flight simulator.
37.06 Demonstrate an ability to control an aircraft in flight using a radio control system.

38.0 DEMONSTRATE AN UNDERSTANDING OF THE EFFECTS OF FLIGHT AS IT RELATES TO BIOTECHNOLOGY--The student will be able to:

38.01 Demonstrate the effects of living in space on plant and animal organisms.
38.02 Plan and build model space craft to demonstrate possible solutions to space travel, extended space living quarters, and providing a living space environment for human exploration of the universe.
38.03 Plan and produce a model system for providing life support systems for space travel.
38.04 Research the biological effects of extended space flight.
38.05 Participate in a space flight simulation.

39.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT RELATED TO AEROSPACE TECHNOLOGY--The student will be able to:

39.01 Identify a problem.
39.02 State a need to research the problem.
39.03 Form a hypothesis about the problem.
39.04 Plan the procedures for researching the problem.
39.05 Conduct the research following the planned procedures.
39.06 Present the research findings in a seminar.
39.07 State conclusions based on the research findings.

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Communications Technology
Occupational Area:	Technology Education
	Secondary
Program Numbers	**8601000**
CIP Number	0821.010600
Grade Level	9-12, 30, 31
Length	3 credits
Certification	INDUS ARTS @4 @6 GRAPH ARTS @4 GEN SHOP @4 PRINTING @7G I ART-TEC 1 @2

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this program is to provide students with a foundation of knowledge and technically oriented experiences in the study of communications technology. This program focuses on transferable skills and stresses understanding and demonstration of the technological tools, machines, instruments, materials, processes and systems in business and industry.

The content includes, but is not limited to, a study of the processes, uses, and technical skills of graphic communication technology. The content and activities also include the study of entrepreneurship, safety, and leadership skills.

Listed below are the courses that make up this program. Design code 243 is the appropriate laboratory facility for this program.

8601010 - Communications Technology I
8601020 - Communications Technology II
8601030 - Communications Technology III

II. **LABORATORY ACTIVITIES**: Instruction and learning activities are provided in a laboratory setting using hands-on experiences with the tools and materials appropriate to the course content.

III. **SPECIAL NOTE**: The Florida Technology Student Association (FL-TSA)is the appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. Vocational student organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

The Level II and Level III courses in this program may articulate into postsecondary Tech-Prep 2 + 2 programs when taken in sequence. Tech-Prep 2 + 2 programs require articulation agreements between secondary and postsecondary educational agencies.

In accordance with HB 2489 - Section 42, approved by the Florida Legislature and signed into law June 16, 1995, Technology Education students who have completed a minimum of three sequential credits in an eligible technology education program by the end of school year 1995-96 and thereafter will be eligible for the Gold Seal designation. The student must also continue in a planned, related post secondary education program.

IV. **INTENDED OUTCOMES:** After successfully completing this program, the student will be able to:

01.0 Demonstrate the ability to work safely with a variety of technologies.
02.0 Demonstrate interpersonal skills as they relate to the workplace.
03.0 Identify and apply methods of information acquisition and utilization.
04.0 Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05.0 Demonstrate and apply design/problem-solving processes.
06.0 Express an understanding of technological systems and their complex interrelationships.
07.0 Demonstrate the ability to properly identify, organize, plan, and allocate resources.
08.0 Discuss individual interests and aptitudes as they relate to a career.
09.0 Demonstrate employability skills.
10.0 Demonstrate an understanding of entrepreneurship.
11.0 Make an informed and meaningful career choice.
12.0 Express a technical knowledge and understanding about major printing processes.
13.0 Describe the properties and specifications of printing materials.
14.0 Demonstrate technical knowledge and skills in the preparation of art and copy for printing reproduction.
15.0 Demonstrate technical knowledge and skills in graphic communications process photography.
16.0 Demonstrate technical knowledge and skills in the processes of platemaking.
17.0 Produce printed copies through the operation of a lithographic offset press.
18.0 Demonstrate technical knowledge and skills in screen process printing.
19.0 Express a technical knowledge and understanding about electronic communication technology.
20.0 Demonstrate technical knowledge and skills in binding and finishing processes.
21.0 Use technical knowledge and skills in continuous tone photography.
22.0 Apply technical knowledge and skills in the processes of multi-colored printing.

23.0 Perform advanced study and technical skills related to graphic communications technology.
24.0 Operate a computer utilizing a program related to graphic communications technology.
25.0 Demonstrate technical knowledge and skills in advanced printing procedures.
26.0 Demonstrate technical knowledge and skills in continuous-tone photography.
27.0 Conduct a research and experimentation project in graphic communications technology.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Communications Technology
Secondary Number: 8601000
Postsecondary Number:

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.

03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  - integers, fractions, and decimals;
  - ratios, proportions, and percentages;
  - roots and powers;
  - algebra;
  - geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.

04.19 Organize and communicate the results obtained by observation and experimentation.

04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).

04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.

08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 EXPRESS A TECHNICAL KNOWLEDGE AND UNDERSTANDING ABOUT MAJOR PRINTING PROCESSES--The student will be able to:

12.01 Explain the processes of relief, gravure, screen lithographic, electrostatic, and projection printing.
12.02 Explain the difference between printing and duplicating processes.

13.0 DESCRIBE THE PROPERTIES AND SPECIFICATIONS OF PRINTING MATERIALS--The student will be able to:

13.01 Describe the types, sizes, quantities and properties of paper.
13.02 Explain the different ingredients and purposes of inks.
13.03 Describe the chemical properties and precautions of graphic arts solvents.
13.04 Describe the manufacturing technology and process in making paper and inks.
13.05 Explain the chemistry and specifications of photographic films and papers.

14.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE PREPARATION OF ART AND COPY FOR PRINTING REPRODUCTION--The student will be able to:

14.01 Explain the principles of graphic communications layout and design.
14.02 Express an understanding of printers' measurements, proofreaders marks, and type styles.
14.03 Demonstrate the processes of cold type composition, phototypesetting, and computer generated type.
14.04 Explain the processes of copyfitting, cropping, and registering.
14.05 Apply the standard procedures and techniques in generating copy or paste-ups for printing reproduction.

15.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN GRAPHIC COMMUNICATIONS PROCESS PHOTOGRAPHY--The student will be able to:

15.01 Identify different styles of process cameras.
15.02 Describe specifications and properties of graphic arts films, screens, and chemicals.
15.03 Display a knowledge of darkroom lighting and ventilation.
15.04 Apply the procedures for camera set up, exposing, film processing, correcting problems, and clean-up.
15.05 Produce a quality line and halftone negative.

16.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE PROCESSES OF PLATEMAKING--The student will be able to:

16.01 Describe the processes for making letterpress and gravure plates.
16.02 Express knowledge about the types, styles, and properties of offset lithographic plates.
16.03 Explain the photomechanics of a photo-offset plate.
16.04 Apply the technical procedures for stripping a flat, generating direct and photo-offset plates, identifying and correcting problems, and preserving and storing plates.
16.05 Produce a quality offset metal plate.

17.0 PRODUCE PRINTED COPIES THROUGH THE OPERATION OF A LITHOGRAPHIC OFFSET PRESS--The student will be able to:

17.01 Identify the major systems and functions of an offset press.
17.02 Perform the standard procedure for operating an offset press, including makeready, operating procedures, identifying and correcting problems, and clean-up.
17.03 Produce a quality offset project.

18.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN SCREEN PROCESS PRINTING--The student will be able to:

18.01 Describe the types of inks and screens for screen process printing.
18.02 Explain the substrate surfaces and materials commonly printed on through the screen printing process.

18.03 Describe the standard procedures for screen printing, including screen preparation, operating procedures, identifying and correcting problems, and clean-up.
18.04 Describe stencil making processes.
18.05 Produce a single color screen print.

19.0 EXPRESS A TECHNICAL KNOWLEDGE AND UNDERSTANDING ABOUT ELECTRONIC COMMUNICATIONS TECHNOLOGY--The student will be able to:

19.01 Describe the theory and technical applications of telephone communications systems.
19.02 Describe the theory and technical processes of radio communications systems applications.
19.03 Describe the theory and technical processes of television communications systems.
19.04 Describe the theory and technical applications of digital data communications.
19.05 Describe the theory and technical applications of satellite communications.

20.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN BINDING AND FINISHING OPERATIONS--The student will be able to:

20.01 Describe standard binding processes.
20.02 Explain die cutting.
20.03 Describe the processes of scoring, folding, gathering, and collating.
20.04 Describe the processes of hot stamping, laminating, perforating, punching, drilling, and thermography.
20.05 Demonstrate the proper and safe use of a paper cutter and trimmer.
20.06 Make a bound and finished printed product using the proper technical skills.

21.0 USE TECHNICAL KNOWLEDGE AND SKILLS IN CONTINUOUS-TONE PHOTOGRAPHY--The student will be able to:

21.01 Describe the standard procedure for making a continuous-tone negative including camera operation, processing film, identifying and correcting problems, and clean-up.
21.02 Describe the standard procedure for making a continous-tone print, including darkroom operation, printing and processing, identifying and correcting problems, and clean-up.
21.03 Produce a quality negative.
21.04 Produce a quality print.

22.0 APPLY TECHNICAL KNOWLEDGE AND SKILLS IN THE PROCESSES OF MULTI-COLOR PRINTING--The student will be able to:

22.01 Design and layout copy for multi-color registration and printing.
22.02 Use the proper technical skills in the layout, preparation, production, and finishing of a multi-colored offset printing job.

22.03 Use the proper technical skills in the layout, preparation, production, and finishing of a multi-colored screen process printed job.

23.0 PERFORM ADVANCED STUDY AND TECHNICAL SKILLS RELATED TO GRAPHIC COMMUNICATIONS TECHNOLOGY--The student will be able to:

23.01 Select an individual or group project in cooperation with teacher.
23.02 Develop a written plan of work to carry out the project.
23.03 Show evidence of technical study in support of the project.
23.04 Perform skills related to the project.
23.05 Complete the project as planned.

24.0 OPERATE A COMPUTER UTILIZING A PROGRAM RELATED TO COMMUNICATIONS TECHNOLOGY--The student will be able to:

24.01 Produce written copy utilizing a word processing program.
24.02 Produce and manipulate artwork utilizing a drawing program.
24.03 Utilize a desktop publishing program to produce camera ready copy.

25.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN ADVANCED PRINTING PROCEDURES--The student will be able to:

25.01 Explain the photographic and lithographic theories and technical skills of color separation printing.
25.02 Explain the screen printing procedures for special materials and for different shaped objects.
25.03 Perform or set up a technical display of the color separation process.
25.04 Print a screen process job on a special shape, surface, or for a special purpose such as printed circuitry.

26.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN CONTINUOUS-TONE PHOTOGRAPHY--The student will be able to:

26.01 Describe the theory and technical processes of producing colored prints and colored slides.
26.02 Describe the theory and technical practices of special-effects photography.
26.03 Describe the theory and technical applications of high-speed photography.
26.04 Produce a photographic study using the technical skills of color, special effects, or high speed photography.

27.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT IN GRAPHIC COMMUNICATIONS TECHNOLOGY--The student will be able to:

27.01 Identify a problem
27.02 State a need to research the problem.
27.03 Form a hypothesis about the problem.
27.04 Plan the procedures for researching the problem.
27.05 Conduct the research following the planned procedures.

27.06 Present the research findings in a seminar.
27.07 State conclusions based on the research findings.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8601010
Course Title: Communications Technology I
Course Credit: 1

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations and technical skills of graphic communications technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  - integers, fractions, and decimals;
  - ratios, proportions, and percentages;
  - roots and powers;
  - algebra;

- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.

07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 EXPRESS A TECHNICAL KNOWLEDGE AND UNDERSTANDING ABOUT MAJOR PRINTING PROCESSES--The student will be able to:

12.01 Explain the processes of relief, gravure, screen lithographic, electrostatic, and projection printing.
12.02 Explain the difference between printing and duplicating processes.

13.0 DESCRIBE THE PROPERTIES AND SPECIFICATIONS OF PRINTING MATERIALS--The student will be able to:

13.01 Describe the types, sizes, quantities and properties of paper.

13.02 Explain the different ingredients and purposes of inks.
13.03 Describe the chemical properties and precautions of graphic arts solvents.
13.04 Describe the manufacturing technology and process in making paper and inks.
13.05 Explain the chemistry and specifications of photographic films and papers.

14.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE PREPARATION OF ART AND COPY FOR PRINTING REPRODUCTION--The student will be able to:

14.01 Explain the principles of graphic communications layout and design.
14.02 Express an understanding of printers' measurements, proofreaders marks, and type styles.
14.03 Demonstrate the processes of cold type composition, phototypesetting, and computer generated type.
14.04 Explain the processes of copyfitting, cropping, and registering.
14.05 Apply the standard procedures and techniques in generating copy or paste-ups for printing reproduction.

15.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN GRAPHIC COMMUNICATIONS PROCESS PHOTOGRAPHY--The student will be able to:

15.01 Identify different styles of process cameras.
15.02 Describe specifications and properties of graphic arts films, screens, and chemicals.
15.03 Display a knowledge of darkroom lighting and ventilation.
15.04 Apply the procedures for camera set up, exposing, film processing, correcting problems, and clean-up.
15.05 Produce a quality line and halftone negative.

16.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE PROCESSES OF PLATEMAKING--The student will be able to:

16.01 Describe the processes for making letterpress and gravure plates.
16.02 Express knowledge about the types, styles, and properties of offset lithographic plates.
16.03 Explain the photomechanics of a photo-offset plate.
16.04 Apply the technical procedures for stripping a flat, generating direct and photo-offset plates, identifying and correcting problems, and preserving and storing plates.
16.05 Produce a quality offset metal plate.

17.0 PRODUCE PRINTED COPIES THROUGH THE OPERATION OF A LITHOGRAPHIC OFFSET PRESS--The student will be able to:

17.01 Identify the major systems and functions of an offset press.
17.02 Perform the standard procedure for operating an offset press, including makeready, operating procedures, identifying and correcting problems, and clean-up.
17.03 Produce a quality offset project.

18.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN SCREEN PROCESS PRINTING--The student will be able to:

18.01 Describe the types of inks and screens for screen process printing.
18.02 Explain the substrate surfaces and materials commonly printed on through the screen printing process.
18.03 Describe the standard procedures for screen printing, including screen preparation, operating procedures, identifying and correcting problems, and clean-up.
18.04 Describe stencil making processes.
18.05 Produce a single color screen print.

19.0 EXPRESS A TECHNICAL KNOWLEDGE AND UNDERSTANDING ABOUT ELECTRONIC COMMUNICATIONS TECHNOLOGY--The student will be able to:

19.01 Describe the theory and technical applications of telephone communications systems.
19.02 Describe the theory and technical processes of radio communications systems applications.
19.03 Describe the theory and technical processes of television communications systems.
19.04 Describe the theory and technical applications of digital data communications.
19.05 Describe the theory and technical applications of satellite communications.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8601020
Course Title: Communications Technology II
Course Credit: 1

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations and technical skills of graphic communications technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

20.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN BINDING AND FINISHING OPERATIONS--The student will be able to:

20.01 Describe standard binding processes.
20.02 Explain die cutting.
20.03 Describe the processes of scoring, folding, gathering, and collating.
20.04 Describe the processes of hot stamping, laminating, perforating, punching, drilling, and thermography.
20.05 Demonstrate the proper and safe use of a paper cutter and trimmer.
20.06 Make a bound and finished printed product using the proper technical skills.

21.0 USE TECHNICAL KNOWLEDGE AND SKILLS IN CONTINUOUS-TONE PHOTOGRAPHY--The student will be able to:

21.01 Describe the standard procedure for making a continuous-tone negative including camera operation, processing film, identifying and correcting problems, and clean-up.
21.02 Describe the standard procedure for making a continous-tone print, including darkroom operation, printing and processing, identifying and correcting problems, and clean-up.
21.03 Produce a quality negative.
21.04 Produce a quality print.

22.0 APPLY TECHNICAL KNOWLEDGE AND SKILLS IN THE PROCESSES OF MULTI-COLOR PRINTING--The student will be able to:

22.01 Design and layout copy for multi-color registration and printing.
22.02 Use the proper technical skills in the layout, preparation, production, and finishing of a multi-colored offset printing job.
22.03 Use the proper technical skills in the layout, preparation, production, and finishing of a multi-colored screen process printed job.

23.0 PERFORM ADVANCED STUDY AND TECHNICAL SKILLS RELATED TO GRAPHIC COMMUNICATIONS TECHNOLOGY--The student will be able to:

23.01 Select an individual or group project in cooperation with teacher.
23.02 Develop a written plan of work to carry out the project.
23.03 Show evidence of technical study in support of the project.
23.04 Perform skills related to the project.
23.05 Complete the project as planned.

Program: 8601000 Communications Technology

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8601030
Course Title: Communications Technology III
Course Credit: 1

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations and technical skills of graphic communications technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;

- algebra;
- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.

04.16 Use elementary concepts of probability and statistics.

04.17 Draw, read, and analyze graphs, charts, and tables.

04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.

04.19 Organize and communicate the results obtained by observation and experimentation.

04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).

04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.

05.03 Design and implement the optimal solution to a given problem.

05.04 Document each step of the design/problem-solving process.

05.05 Demonstrate "brainstorming" as a process to solve problems.

05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.

06.02 Explore methods used to monitor and correct performance of technological systems.

06.03 Design and implement an optimal solution to a given problem.

06.04 Outline major historical technological developments or events.

06.05 Identify recent advances in technology.

06.06 Explain problem-solving roles of technology.

06.07 Forecast a technological development or event.

06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.

07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.

07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

24.0 OPERATE A COMPUTER UTILIZING A PROGRAM RELATED TO COMMUNICATIONS TECHNOLOGY--The student will be able to:

24.01 Produce written copy utilizing a word processing program.
24.02 Produce and manipulate artwork utilizing a drawing program.
24.03 Utilize a desktop publishing program to produce camera ready copy.

25.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN ADVANCED PRINTING PROCEDURES--The student will be able to:

25.01 Explain the photographic and lithographic theories and technical skills of color separation printing.
25.02 Explain the screen printing procedures for special materials and for different shaped objects.
25.03 Perform or set up a technical display of the color separation process.
25.04 Print a screen process job on a special shape, surface, or for a special purpose such as printed circuitry.

26.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN CONTINUOUS-TONE PHOTOGRAPHY--The student will be able to:

26.01 Describe the theory and technical processes of producing colored prints and colored slides.
26.02 Describe the theory and technical practices of special-effects photography.
26.03 Describe the theory and technical applications of high-speed photography.
26.04 Produce a photographic study using the technical skills of color, special effects, or high speed photography.

27.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT IN GRAPHIC COMMUNICATIONS TECHNOLOGY--The student will be able to:

27.01 Identify a problem
27.02 State a need to research the problem.
27.03 Form a hypothesis about the problem.
27.04 Plan the procedures for researching the problem.
27.05 Conduct the research following the planned procedures.
27.06 Present the research findings in a seminar.
27.07 State conclusions based on the research findings.

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Construction Technology
Occupational Area:	Technology Education
	Secondary
Program Numbers	**8600700**
CIP Number	0821.010200
Grade Level	9-12, 30, 31
Length	3 credits
Certification	INDUS ARTS @4 @6
	WOODWORK @4
	GEN SHOP @4
	TEC CONSTR @7G
	CARPENTRY @7G
	BLDG CONST @7G
	I ART-TEC 1 @2

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this program is to provide students with a foundation of knowledge and technically oriented experiences in the study of construction technology. This program focuses on transferable skills and stresses understanding and demonstration of the technological tolls, machines, instruments, materials, processes and systems in business and industry.

The content includes, but is not limited to, a study of the tools, materials, processes, and technical skills of construction technology. The content and activities will also include the study of entrepreneurship, safety, and leadership skills.

Listed below are the courses that make up this program. Design Code 243 is the appropriate laboratory facility for this program.

8600710 - Construction Technology I
8600720 - Construction Technology II
8600730 - Construction Technology III

II. **LABORATORY ACTIVITIES**: Instruction and learning activities are provided in a laboratory setting using hands-on experiences with the tools and materials appropriate to the course content.

III. **SPECIAL NOTE**: The Florida Technology Student Association (FL-TSA)is the appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. Vocational student organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

The Intermediate and Advance courses in this program may articulate into postsecondary Tech-Prep 2 + 2 programs when taken in sequence. Tech-

Prep 2 + 2 programs require articulation agreements between secondary and postsecondary educational agencies.

In accordance with HB 2489 - Section 42, approved by the Florida Legislature and signed into law June 16, 1995, Technology Education students who have completed a minimum of three sequential credits in an eligible technology education program by the end of school year 1995-96 and thereafter will be eligible for the Gold Seal designation. The student must also continue in a planned, related post secondary education program.

IV. **INTENDED OUTCOMES:** After successfully completing this program, the student will be able to:

01.0 Demonstrate the ability to work safely with a variety of technologies.

02.0 Demonstrate interpersonal skills as they relate to the workplace.

03.0 Identify and apply methods of information acquisition and utilization.

04.0 Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.

05.0 Demonstrate and apply design/problem-solving processes.

06.0 Express an understanding of technological systems and their complex interrelationships.

07.0 Demonstrate the ability to properly identify, organize, plan, and allocate resources.

08.0 Discuss individual interests and aptitudes as they relate to a career.

09.0 Demonstrate employability skills.

10.0 Demonstrate an understanding of entrepreneurship.

11.0 Make an informed and meaningful career choice.

12.0 Demonstrate basic technical knowledge and skills about construction technology.

13.0 Demonstrate technical knowledge and skills about selecting and preparing a construction site.

14.0 Demonstrate technical knowledge and skills about designing and engineering constructed works.

15.0 Demonstrate technical knowledge and skills about contracting, estimating, bidding, and scheduling.

16.0 Demonstrate technical knowledge and skills about constructing substructures.

17.0 Demonstrate technical knowledge and skills about constructing superstructures.

18.0 Demonstrate technical knowledge and skills about installing utilities.

19.0 Demonstrate technical knowledge and skills about enclosing superstructures.

20.0 Demonstrate technical knowledge and skills about interior and exterior finishing of a constructed structure.

21.0 Apply advanced technical knowledge and skills about construction technology.

22.0 Demonstrate technical knowledge and skills about selecting and preparing a construction site.

23.0 Demonstrate technical knowledge and skills about designing and engineering constructed works.

24.0 Demonstrate technical knowledge and skills about contracting, estimating, bidding, and scheduling.

25.0 Demonstrate technical knowledge and skills about constructing substructures.

26.0 Demonstrate technical knowledge and skills about constructing superstructures.

27.0 Demonstrate technical knowledge and skills about installing utilities.

28.0 Demonstrate technical knowledge and skills about enclosing superstructures.

29.0 Demonstrate technical knowledge and skills about interior and exterior finishing of a constructed structure.

30.0 Perform advanced study and technical skills related to construction technology.

31.0 Operate a computer utilizing a program related to construction technology.

32.0 Demonstrate technical knowledge and skills about regional planning and the construction of civil or community structures.

33.0 Conduct structural tests on constructed structures and construction materials.

34.0 Conduct a research and experimentation project on a construction technology process or material.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Construction Technology
Secondary Number: 8600700
Postsecondary Number:

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.

03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.

03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.

04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.

04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.

04.04 Distinguish fact from opinion.

04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.

04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.

04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.

04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.

04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.

04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.

04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.

04.14 Use the mathematics of:
- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.

04.16 Use elementary concepts of probability and statistics.

04.17 Draw, read, and analyze graphs, charts, and tables.

04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.

04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.

08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 DEMONSTRATE BASIC TECHNICAL KNOWLEDGE AND SKILLS ABOUT CONSTRUCTION TECHNOLOGY--The student will be able to:

12.01 Demonstrate basic technical knowledge and skills about student performance standards 14.01 through 21.02.
12.02 Demonstrate basic technical knowledge and skills in the construction of a structure.

13.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT SELECTING AND PREPARING A CONSTRUCTION SITE--The student will be able to:

13.01 Explain the steps and processes for identifying, negotiating, selecting, and acquiring sites for construction.
13.02 Explain and perform the elementary technical skills for surveying or mapping a construction site.
13.03 Describe the tools, equipment, and technical skills required for excavating a construction site.
13.04 Explain the load bearing importance of the earth and the reason for soils testing at a construction site.

14.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT DESIGNING AND ENGINEERING CONSTRUCTED WORKS--The student will be able to:

14.01 Read and interpret architectural drawings, blueprints, symbols, and construction plans.
14.02 Describe building codes, permits, and inspection requirements.
14.03 Sketch or draw a plan for a construction project.

15.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT CONTRACTING, ESTIMATING, BIDDING, AND SCHEDULING--The student will be able to:

15.01 Estimate construction costs using various methods including a computer.
15.02 Read and prepare bid invitations for contractors to build a construction project.
15.03 Establish criteria for awarding a construction contract.
15.04 Describe the content of a construction contract and performance bond.

16.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT CONSTRUCTING SUBSTRUCTURES--The student will be able to:

16.01 Describe the types, parts, and purposes of foundations.
16.02 Describe the tools, materials, and processes for setting foundations.
16.03 Mix, place, and finish concrete for a floor, wall, or footing.
16.04 Perform the masonry technical skills of laying brick or block.

17.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT CONSTRUCTING SUPERSTRUCTURES--The student will be able to:

17.01 Describe mass, solid wall, frame, and air-supported superstructures.
17.02 Describe the materials used in the construction of superstructures.
17.03 Use technical carpentry skills, tools, and materials in constructing a wood frame superstructure.
17.04 Use technical construction skills in building a steel or concrete frame superstructure.
17.05 Describe factory manufacturing of superstructures and modules.

18.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT INSTALLING UTILITIES--The student will be able to:

18.01 Describe public utility systems for supplying water, electricity, natural gas, and sewerage.
18.02 Describe the functions and operation of heating, cooling, and ventilating systems.
18.03 Demonstrate a technical knowledge of plumbing and electrical systems in homes or buildings.
18.04 Use the technical tools and skills to install plumbing and electrical systems utilities.
18.05 Diagnose and troubleshoot problems with utility systems.

19.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT ENCLOSING SUPERSTRUCTURES--The student will be able to:

19.01 Describe the different types of materials and methods for constructing interior and exterior walls.
19.02 Describe the different types of materials and methods for laying floors and for building roofs.
19.03 Describe the different types of methods for constructing or installing windows and doors.
19.04 Describe the purposes, materials, and methods for insulating enclosed superstructures.
19.05 Perform the technical skills of enclosing a superstructure.

20.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT INTERIOR AND EXTERIOR FINISHING OF A CONSTRUCTED STRUCTURE--The student will be able to:

20.01 Describe the different types of materials and methods for trimming, painting, and decorating a constructed structure.
20.02 Describe the types of accessories and fixtures that are installed to finish completed construction.
20.03 Explain the materials and methods used for the finishing processes of paving and landscaping.
20.04 Participate in processes of finishing a construction project and site.

21.0 APPLY ADVANCED TECHNICAL KNOWLEDGE AND SKILLS ABOUT CONSTRUCTION TECHNOLOGY--The student will be able to:

21.01 Apply advanced technical knowledge and skills about student performance standards 14.01 through 21.02.
21.02 Apply advanced technical knowledge and skills in the construction of a structure.

22.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT SELECTING AND PREPARING A CONSTRUCTION SITE--The student will be able to:

22.01 Explain the steps and processes for identifying, negotiating, selecting, and acquiring sites for construction.
22.02 Explain and perform the elementary technical skills for surveying or mapping a construction site.
22.03 Describe the tools, equipment, and technical skills required for excavating a construction site.
22.04 Explain the load bearing importance of the earth and the reason for soils testing at a construction site.

23.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT DESIGNING AND ENGINEERING CONSTRUCTED WORKS--The student will be able to:

23.01 Read and interpret architectural drawings, blueprints, symbols, and construction plans.
23.02 Describe building codes, permits, and inspection requirements.
23.03 Sketch or draw a plan for a construction project.

24.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT CONTRACTING, ESTIMATING, BIDDING, AND SCHEDULING--The student will be able to:

24.01 Estimate construction costs using various methods including a computer.
24.02 Read and prepare bid invitations for contractors to build a construction project.
24.03 Establish criteria for awarding a construction contract.
24.04 Describe the content of a construction contract and performance bond.

25.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT CONSTRUCTING SUBSTRUCTURES--The student will be able to:

25.01 Describe the types, parts, and purposes of foundations.
25.02 Describe the tools, materials, and processes for setting foundations.
25.03 Mix, place, and finish concrete for a floor, wall, or footing.
25.04 Perform the masonry technical skills of laying brick or block.

26.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT CONSTRUCTING SUPERSTRUCTURES--The student will be able to:

26.01 Describe mass, solid wall, frame, and air-supported superstructures.
26.02 Describe the materials used in the construction of superstructures.
26.03 Use technical carpentry skills, tools, and materials in constructing a wood frame superstructure.
26.04 Use technical construction skills in building a steel or concrete frame superstructure.
26.05 Describe factory manufacturing of superstructures and modules.

27.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT INSTALLING UTILITIES--The student will be able to:

27.01 Describe public utility systems for supplying water, electricity, natural gas, and sewerage.
27.02 Describe the functions and operation of heating, cooling, and ventilating systems.
27.03 Demonstrate a technical knowledge of plumbing and electrical systems in homes or buildings.
27.04 Use the technical tools and skills to install plumbing and electrical systems utilities.
27.05 Diagnose and troubleshoot problems with utility systems.

28.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT ENCLOSING SUPERSTRUCTURES--The student will be able to:

28.01 Describe the different types of materials and methods for constructing interior and exterior walls.
28.02 Describe the different types of materials and methods for laying floors and for building roofs.

28.03 Describe the different types of methods for constructing or installing windows and doors.
28.04 Describe the purposes, materials, and methods for insulating enclosed superstructures.
28.05 Perform the technical skills of enclosing a superstructure.

29.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT INTERIOR AND EXTERIOR FINISHING OF A CONSTRUCTED STRUCTURE--The student will be able to:

29.01 Describe the different types of materials and methods for trimming, painting, and decorating a constructed structure.
29.02 Describe the types of accessories and fixtures that are installed to finish completed construction.
29.03 Explain the materials and methods used for the finishing processes of paving and landscaping.
29.04 Participate in processes of finishing a construction project and site.

30.0 PERFORM ADVANCED STUDY AND TECHNICAL SKILLS RELATED TO CONSTRUCTION TECHNOLOGY--The student will be able to:

30.01 Select an individual or group project in cooperation with the teacher.
30.02 Develop a written plan of work to carry out the project.
30.03 Show evidence of technical study in support of the project.
30.04 Perform skills related to the project.
30.05 Complete the project as planned.

31.0 OPERATE A COMPUTER UTILIZING A PROGRAM RELATED TO CONSTRUCTION TECHNOLOGY--The student will be able to:

31.01 Collect or produce data on construction technology through the operation of a computer.

32.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT REGIONAL PLANNING AND THE CONSTRUCTION OF CIVIL OR COMMUNITY STRUCTURES--The student will be able to:

32.01 Discuss community and regional planning needs and processes for the construction of roads, parks, dams, airports, seaports, warehouses, shopping centers, factories, and skyscrapers.
32.02 Develop a scale model of one of the above structures and give a report on the need

33.0 CONDUCT STRUCTURAL TESTS ON CONSTRUCTED STRUCTURES AND CONSTRUCTION MATERIALS--The student will be able to:

33.01 Perform scientific and technical tests on the strength, life, and uses of structures.
33.02 Perform scientific and technical tests on a variety of construction materials.

34.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON A CONSTRUCTION MATERIAL OR PROCESS--The student will be able to:

34.01 Identify a problem.
34.02 State a need to research the problem.
34.03 Form a hypothesis about the problem.
34.04 Plan the procedures for researching the problem.
34.05 Conduct the research following the planned procedures.
34.06 Present the research findings in a seminar.
34.07 State conclusions based on the research findings.

Program: 8600700 Construction Technology

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600710
Course Title: Construction Technology I
Course Credit: 1

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations, and technical skills of construction technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

BEST COPY AVAILABLE

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 DEMONSTRATE BASIC TECHNICAL KNOWLEDGE AND SKILLS ABOUT CONSTRUCTION TECHNOLOGY--The student will be able to:

12.01 Demonstrate basic technical knowledge and skills about student performance standards 14.01 through 21.02.
12.02 Demonstrate basic technical knowledge and skills in the construction of a structure.

13.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT SELECTING AND PREPARING A CONSTRUCTION SITE--The student will be able to:

13.01 Explain the steps and processes for identifying, negotiating, selecting, and acquiring sites for construction.

13.02 Explain and perform the elementary technical skills for surveying or mapping a construction site.
13.03 Describe the tools, equipment, and technical skills required for excavating a construction site.
13.04 Explain the load bearing importance of the earth and the reason for soils testing at a construction site.

14.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT DESIGNING AND ENGINEERING CONSTRUCTED WORKS--The student will be able to:

14.01 Read and interpret architectural drawings, blueprints, symbols, and construction plans.
14.02 Describe building codes, permits, and inspection requirements.
14.03 Sketch or draw a plan for a construction project.

15.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT CONTRACTING, ESTIMATING, BIDDING, AND SCHEDULING--The student will be able to:

15.01 Estimate construction costs using various methods including a computer.
15.02 Read and prepare bid invitations for contractors to build a construction project.
15.03 Establish criteria for awarding a construction contract.
15.04 Describe the content of a construction contract and performance bond.

16.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT CONSTRUCTING SUBSTRUCTURES--The student will be able to:

16.01 Describe the types, parts, and purposes of foundations.
16.02 Describe the tools, materials, and processes for setting foundations.
16.03 Mix, place, and finish concrete for a floor, wall, or footing.
16.04 Perform the masonry technical skills of laying brick or block.

17.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT CONSTRUCTING SUPERSTRUCTURES--The student will be able to:

17.01 Describe mass, solid wall, frame, and air-supported superstructures.
17.02 Describe the materials used in the construction of superstructures.
17.03 Use technical carpentry skills, tools, and materials in constructing a wood frame superstructure.
17.04 Use technical construction skills in building a steel or concrete frame superstructure.
17.05 Describe factory manufacturing of superstructures and modules.

18.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT INSTALLING UTILITIES--The student will be able to:

18.01 Describe public utility systems for supplying water, electricity, natural gas, and sewerage.

18.02 Describe the functions and operation of heating, cooling, and ventilating systems.

18.03 Demonstrate a technical knowledge of plumbing and electrical systems in homes or buildings.

18.04 Use the technical tools and skills to install plumbing and electrical systems utilities.

18.05 Diagnose and troubleshoot problems with utility systems.

19.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT ENCLOSING SUPERSTRUCTURES--The student will be able to:

19.01 Describe the different types of materials and methods for constructing interior and exterior walls.

19.02 Describe the different types of materials and methods for laying floors and for building roofs.

19.03 Describe the different types of methods for constructing or installing windows and doors.

19.04 Describe the purposes, materials, and methods for insulating enclosed superstructures.

19.05 Perform the technical skills of enclosing a superstructure.

20.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT INTERIOR AND EXTERIOR FINISHING OF A CONSTRUCTED STRUCTURE--The student will be able to:

20.01 Describe the different types of materials and methods for trimming, painting, and decorating a constructed structure.

20.02 Describe the types of accessories and fixtures that are installed to finish completed construction.

20.03 Explain the materials and methods used for the finishing processes of paving and landscaping.

20.04 Participate in processes of finishing a construction project and site.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600720
Course Title: Construction Technology II
Course Credit: 1

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations, and technical skills of construction technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

- 01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
- 01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
- 01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
- 01.04 Follow laboratory safety rules and procedures.
- 01.05 Demonstrate good housekeeping at work station within total laboratory.
- 01.06 Identify color-coding safety standards.
- 01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
- 01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

- 02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
- 02.02 Participate as a member of a team.
- 02.03 Teach others new skills.
- 02.04 Identify skills needed to serve clients/customers.
- 02.05 Demonstrate leadership skills.
- 02.06 Describe strategies necessary for negotiating agreements.
- 02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
- 02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
- 02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
- 02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.

03.02 Identify and describe methods of information acquisition and evalution.

03.03 Discuss advantages and disadvantages in the application of technologies.

03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.

03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.

04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.

04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.

04.04 Distinguish fact from opinion.

04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.

04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.

04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.

04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.

04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.

04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.

04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.

04.14 Use the mathematics of:

- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

BEST COPY AVAILABLE

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

21.0 APPLY ADVANCED TECHNICAL KNOWLEDGE AND SKILLS ABOUT CONSTRUCTION TECHNOLOGY--The student will be able to:

21.01 Apply advanced technical knowledge and skills about student performance standards 14.01 through 21.02.
21.02 Apply advanced technical knowledge and skills in the construction of a structure.

22.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT SELECTING AND PREPARING A CONSTRUCTION SITE--The student will be able to:

22.01 Explain the steps and processes for identifying, negotiating, selecting, and acquiring sites for construction.

22.02 Explain and perform the elementary technical skills for surveying or mapping a construction site.

22.03 Describe the tools, equipment, and technical skills required for excavating a construction site.

22.04 Explain the load bearing importance of the earth and the reason for soils testing at a construction site.

23.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT DESIGNING AND ENGINEERING CONSTRUCTED WORKS--The student will be able to:

23.01 Read and interpret architectural drawings, blueprints, symbols, and construction plans.

23.02 Describe building codes, permits, and inspection requirements.

23.03 Sketch or draw a plan for a construction project.

24.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT CONTRACTING, ESTIMATING, BIDDING, AND SCHEDULING--The student will be able to:

24.01 Estimate construction costs using various methods including a computer.

24.02 Read and prepare bid invitations for contractors to build a construction project.

24.03 Establish criteria for awarding a construction contract.

24.04 Describe the content of a construction contract and performance bond.

25.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT CONSTRUCTING SUBSTRUCTURES--The student will be able to:

25.01 Describe the types, parts, and purposes of foundations.

25.02 Describe the tools, materials, and processes for setting foundations.

25.03 Mix, place, and finish concrete for a floor, wall, or footing.

25.04 Perform the masonry technical skills of laying brick or block.

26.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT CONSTRUCTING SUPERSTRUCTURES--The student will be able to:

26.01 Describe mass, solid wall, frame, and air-supported superstructures.

26.02 Describe the materials used in the construction of superstructures.

26.03 Use technical carpentry skills, tools, and materials in constructing a wood frame superstructure.

26.04 Use technical construction skills in building a steel or concrete frame superstructure.

26.05 Describe factory manufacturing of superstructures and modules.

27.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT INSTALLING UTILITIES--The student will be able to:

27.01 Describe public utility systems for supplying water, electricity, natural gas, and sewerage.

27.02 Describe the functions and operation of heating, cooling, and ventilating systems.
27.03 Demonstrate a technical knowledge of plumbing and electrical systems in homes or buildings.
27.04 Use the technical tools and skills to install plumbing and electrical systems utilities.
27.05 Diagnose and troubleshoot problems with utility systems.

28.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT ENCLOSING SUPERSTRUCTURES--The student will be able to:

28.01 Describe the different types of materials and methods for constructing interior and exterior walls.
28.02 Describe the different types of materials and methods for laying floors and for building roofs.
28.03 Describe the different types of methods for constructing or installing windows and doors.
28.04 Describe the purposes, materials, and methods for insulating enclosed superstructures.
28.05 Perform the technical skills of enclosing a superstructure.

29.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT INTERIOR AND EXTERIOR FINISHING OF A CONSTRUCTED STRUCTURE--The student will be able to:

29.01 Describe the different types of materials and methods for trimming, painting, and decorating a constructed structure.
29.02 Describe the types of accessories and fixtures that are installed to finish completed construction.
29.03 Explain the materials and methods used for the finishing processes of paving and landscaping.
29.04 Participate in processes of finishing a construction project and site.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600730
Course Title: Construction Technology III
Course Credit: 1

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations, and technical skills of construction technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  - integers, fractions, and decimals;
  - ratios, proportions, and percentages;
  - roots and powers;
  - algebra;
  - geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

30.0 PERFORM ADVANCED STUDY AND TECHNICAL SKILLS RELATED TO CONSTRUCTION TECHNOLOGY--The student will be able to:

30.01 Select an individual or group project in cooperation with the teacher.
30.02 Develop a written plan of work to carry out the project.
30.03 Show evidence of technical study in support of the project.
30.04 Perform skills related to the project.
30.05 Complete the project as planned.

31.0 OPERATE A COMPUTER UTILIZING A PROGRAM RELATED TO CONSTRUCTION TECHNOLOGY--The student will be able to:

277

31.01 Collect or produce data on construction technology through the operation of a computer.

32.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT REGIONAL PLANNING AND THE CONSTRUCTION OF CIVIL OR COMMUNITY STRUCTURES--The student will be able to:

32.01 Discuss community and regional planning needs and processes for the construction of roads, parks, dams, airports, seaports, warehouses, shopping centers, factories, and skyscrapers.
32.02 Develop a scale model of one of the above structures and give a report on the need

33.0 CONDUCT STRUCTURAL TESTS ON CONSTRUCTED STRUCTURES AND CONSTRUCTION MATERIALS--The student will be able to:

33.01 Perform scientific and technical tests on the strength, life, and uses of structures.
33.02 Perform scientific and technical tests on a variety of construction materials.

34.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON A CONSTRUCTION MATERIAL OR PROCESS--The student will be able to:

34.01 Identify a problem.
34.02 State a need to research the problem.
34.03 Form a hypothesis about the problem.
34.04 Plan the procedures for researching the problem.
34.05 Conduct the research following the planned procedures.
34.06 Present the research findings in a seminar.
34.07 State conclusions based on the research findings.

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Drafting/Illustrative Design Technology
Occupational Area:	Technology Education
	Secondary
Program Numbers	**8600800**
CIP Number	0821.010300
Grade Level	9-12, 30, 31
Length	3 credits
Certification	INDUS ARTS @4 @6 GRAPH ARTS @4 GEN SHOP @4 DRAFTING @7G I ART-TEC 1 @2

I. **MAJOR CONCEPTS/CONTENT:** The purpose of this program is to provide students with a foundation of knowledge and technically oriented experiences in the study of drafting and design technology. This program focuses on transferable skills and stresses understanding and demonstration of the technological tools, machines, instruments, materials, processes and systems in business and industry.

The content includes, but is not limited to, a study of the purposes,instruments, processes, and technical skills of drafting technology. The content and activities will also include the study of entrepreneurship, safety, and leadership skills.

Listed below are the courses that make up this program. Design Code 242 is the appropriate laboratory facility for this program.

8600810 - Drafting/Illustrative Design Technology I
8600820 - Drafting/Illustrative Design Technology II
8600830 - Drafting/Illustrative Design Technology III

II. **LABORATORY ACTIVITIES:** Instruction and learning activities are provided in a laboratory setting using hands-on experiences with the tools and materials appropriate to the course content.

III. **SPECIAL NOTE:** The Florida Technology Student Association (FL-TSA) is the appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. Vocational student organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

The Level II and Level III courses in this program may articulate into postsecondary Tech-Prep 2 + 2 programs when taken in sequence. Tech-Prep 2 + 2 programs require articulation agreements between secondary and postsecondary educational agencies.

In accordance with HB 2489 - Section 42, approved by the Florida Legislature and signed into law June 16, 1995, Technology Education students who have completed a minimum of three sequential credits in an eligible technology education program by the end of school year 1995-96 and thereafter will be eligible for the Gold Seal designation. The student must also continue in a planned, related post secondary education program.

IV. **INTENDED OUTCOMES:** After successfully completing this program, the student will be able to:

01.0 Demonstrate the ability to work safely with a variety of technologies.
02.0 Demonstrate interpersonal skills as they relate to the workplace.
03.0 Identify and apply methods of information acquisition and utilization.
04.0 Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05.0 Demonstrate and apply design/problem-solving processes.
06.0 Express an understanding of technological systems and their complex interrelationships.
07.0 Demonstrate the ability to properly identify, organize, plan, and allocate resources.
08.0 Discuss individual interests and aptitudes as they relate to a career.
09.0 Demonstrate employability skills.
10.0 Demonstrate an understanding of entrepreneurship.
11.0 Make an informed and meaningful career choice.
12.0 Demonstrate technical knowledge and skills about the use and care of drafting instruments, equipment, and materials.
13.0 Demonstrate technical skills and applications common to all types of drafting.
14.0 Demonstrate technical knowledge and skills for making orthographic drawings.
15.0 Demonstrate technical knowledge and skills for making pictorial drawings.
16.0 Demonstrate technical knowledge and skills for making auxiliary view drawings.
17.0 Demonstrate technical knowledge and skills for making sectional view drawings.
18.0 Demonstrate technical knowledge and skills for making engineering drawings.
19.0 Demonstrate technical knowledge and skills for making architectural drawings.
20.0 Demonstrate technical knowledge and skills for making orthographic drawings.
21.0 Demonstrate technical knowledge and skills for making pictorial drawings.
22.0 Demonstrate technical knowledge and skills for making sectional view drawings.

23.0 Demonstrate technical knowledge and skills for making engineering drawings.

24.0 Demonstrate technical knowledge and skills for making architectural drawings.

25.0 Demonstrate technical knowledge and skills for making technical illustrations.

26.0 Demonstrate basic technical knowledge and skills for making a computer-assisted drawing (CAD).

27.0 Perform advanced study and technical skills related to drafting technology.

28.0 Operate a computer utilizing a program related to drafting technology.

29.0 Demonstrate technical knowledge and skills about modeling as a drafting aid.

30.0 Demonstrate technical knowledge and skills about the fundamentals of design and design procedures.

31.0 Conduct a research and experimentation project on drafting technology.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Drafting/Illustrative Design Technology
Secondary Number: 8600800
Postsecondary Number:

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.

03.03 Discuss advantages and disadvantages in the application of technologies.

03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.

03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.

04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.

04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.

04.04 Distinguish fact from opinion.

04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.

04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.

04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.

04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.

04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.

04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.

04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.

04.14 Use the mathematics of:
- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.

04.16 Use elementary concepts of probability and statistics.

04.17 Draw, read, and analyze graphs, charts, and tables.

04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.

04.19 Organize and communicate the results obtained by observation and experimentation.

04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).

04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.

05.03 Design and implement the optimal solution to a given problem.

05.04 Document each step of the design/problem-solving process.

05.05 Demonstrate "brainstorming" as a process to solve problems.

05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.

06.02 Explore methods used to monitor and correct performance of technological systems.

06.03 Design and implement an optimal solution to a given problem.

06.04 Outline major historical technological developments or events.

06.05 Identify recent advances in technology.

06.06 Explain problem-solving roles of technology.

06.07 Forecast a technological development or event.

06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.

07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.

07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.

07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

BEST COPY AVAILABLE

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT THE USE AND CARE OF DRAFTING INSTRUMENTS, EQUIPMENT, AND MATERIALS--The student will be able to:

12.01 Identify and demonstrate technical knowledge and skills about the use and care of drafting instruments.
12.02 Identify and demonstrate technical knowledge and skills about the use and care of drafting equipment.
12.03 Demonstrate technical knowledge and skills about the properties, specifications, and use of drafting materials and supplies.

13.0 DEMONSTRATE TECHNICAL SKILLS AND APPLICATIONS COMMON TO ALL TYPES OF DRAFTING--The student will be able to:

13.01 Use proper drafting symbols and alphabet of lines in accordance with technical standards and practices.
13.02 Apply proper lettering techniques.
13.03 Apply geometric construction techniques.
13.04 Interpret information from drawings, prints, and sketches.
13.05 Make freehand sketches.
13.06 Produce and reproduce drawings using modern technical methods for drafting reproduction.

14.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING ORTHOGRAPHIC DRAWINGS--The student will be able to:

14.01 Explain the theory of orthographic projection.
14.02 Identify the six principal views of an object.
14.03 Produce a three-view orthographic drawing.
14.04 Produce a CAD generated three-view orthograhic drawing.

15.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING PICTORIAL DRAWINGS--The student will be able to:

15.01 Explain methods of pictorial drawing.
15.02 Produce an isometric drawing.
15.03 Produce a CAD generated isometric drawing.
15.04 Produce a oblique drawing.
15.05 Produce a CAD generated oblique drawing.
15.06 Produce a perspective drawing.

16.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING AUXILIARY VIEW DRAWINGS--The student will be able to:

16.01 Describe the terms normal view, inclined surface, and skewed surface.
16.02 Produce an auxiliary view drawing.
16.03 Produce a CAD auxiliary view drawing.

17.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING SECTIONAL VIEW DRAWINGS--The student will be able to:

17.01 Define sectional view.
17.02 Describe types of sectional views.
17.03 Illustrates the types of breaks and symbols used in drawing sectional views.
17.04 Produce a sectional view drawing.
17.05 Produce a CAD generated sectional view drawing.

18.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING ENGINEERING DRAWINGS--The student will be able to:

18.01 Produce detailed machine drawings with tolerances, cams, gears, hidden surfaces and other mechanical details.

18.02 Produce detailed assembly drawings with screws, keys, rivets, welded joints, and other assembly details.
18.03 Produce detailed electronic schematics with circuits, power sources, controls, and other electronic components.

19.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING ARCHITECTURAL DRAWING--The student will be able to:

19.01 Produce dimensional floor plan drawings showing walls, windows, doors, cabinets, stairs, appliances, fixtrures, and other details.
19.02 Produce dimensional elevation drawings showing grade lines, floors, ceilings, windows, doors, and other details.

20.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING ORTHOGRAPHIC DRAWINGS--The student will be able to:

20.01 Identify the six principal views of an object.
20.02 Produce a three-view orthographic drawing.
20.03 Produce a CAD generated three-view orthograhic drawing.

21.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING PICTORIAL DRAWINGS--The student will be able to:

21.01 Explain methods of pictorial drawings.
21.02 Produce an advanced isometric drawing.
21.03 Produce a CAD generated advanced isometric drawing.
21.04 Produce and advanced oblique drawing.
21.05 Produce a CAD generated advanced oblique drawing.

22.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING SECTIONAL VIEW DRAWINGS--The student will be able to:

22.01 Define sectional view.
22.02 Produce an advanced sectional view drawing.
22.03 Produce a CAD generated advance sectional view.

23.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING ENGINEERING DRAWINGS--The student will be able to:

23.01 Produce an advanced detailed machine drawings with tolerances, cams, gears, hidden surfaces and other mechanical details.
23.02 Produce a CAD generated advanced detailed machine drawing.

24.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING ARCHITECTURAL DRAWINGS--The student will be able to:

24.01 Produce dimensioned floor plan drawings showing walls, windows, doors, cabinets, stairs, appliances, fixtures, and other details.
24.02 Produce a CAD generated dimensional floor plan.
24.03 Produce dimensional elevation drawings showing grade lines, floors, ceilings, windows, doors, and other details.
24.04 Produce a CAD generated dimensional elevation drawing.

24.05 Produce a dimensional architectural electrical plan.
24.06 Produce a CAD generated dimensional electrical plan.
24.07 Produce a dimensional architectural plumbing plan.
24.08 Produce a CAD generated dimensional architectural plumbing plan.
24.09 Produce a dimensional architectural climate control plan.
24.10 Produce a CAD generated dimensional climate control plan.
24.11 Produce a dimensional landscape plan for a construction site.
24.12 Produce a CAD generated dimensional landscape plan.

25.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING TECHNICAL ILLUSTRATIONS--The student will be able to:

25.01 Produce a colored or shaded pictorial rendering for presentation.
25.02 Produce a labeled graph or chart for display.
25.03 Produce a dimensioned map or topographic drawing of land, sea, or air boundaries.

26.0 DEMONSTRATE BASIC TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING A COMPUTER ASSISTED DRAWING (CAD)--The student will be able to:

26.01 Apply basic knowledge and skills of drafting on CAD systems by completing assigned drawings in either the engineering, architectural, or technical illustrations classification.
26.02 Plot a drawing generated by CAD.

27.0 PERFORM ADVANCED STUDY AND TECHNICAL SKILLS RELATED TO DRAFTING TECHNOLOGY--The student will be able to:

27.01 Select an individual or group project in cooperation with the teacher.
27.02 Develop a written plan of work to carry out the project.
27.03 Show evidence of technical study in support of the project.
27.04 Perform skills related to the project.
27.05 Complete the project as planned.

28.0 OPERATE A COMPUTER UTILIZING A PROGRAM RELATED TO DRAFTING TECHNOLOGY--The student will be able to:

28.01 Collect or produce data on drafting technology through the operation of a computer.

29.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT MODELING AS A DRAFTING AID--The student will be able to:

29.01 Demonstrate the technical skills of producing a clay, wax, wood, plastic, or cardboard scale model.
29.02 Build a scale model to represent an architectural design, prototype design, plot-plan, route layout, equipment design, or equipment arrangement.
29.03 Demonstrate the use of photography in producing or presenting model photo drawings.

BEST COPY AVAILABLE

30.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT THE FUNDAMENTALS OF DESIGN AND DESIGN PROCEDURES--The student will be able to:

30.01 Describe the basic principles and functions of good design.
30.02 Outline steps and procedures followed in the design of a product.
30.03 Demonstrate ways in which designs are presented to manufacturers and to customers.
30.04 Develop a variety of designs using conventional methods and a CAD system.

31.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON DRAFTING TECHNOLOGY--The student will be able to:

31.01 Identify a problem.
31.02 State a need to research the problem.
31.03 Form a hypothesis about the problem.
31.04 Plan the procedures of researching the problem.
31.05 Conduct the research following the planned procedures.
31.06 Present the research findings in a seminar.
31.07 State conclusions based on the research findings.

BEST COPY AVAILABLE

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600810
Course Title: Drafting/Illustrative Design Technology I
Course Credit: 1

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations, and technical skills of drafting technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.

03.02 Identify and describe methods of information acquisition and evalution.

03.03 Discuss advantages and disadvantages in the application of technologies.

03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.

03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.

04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.

04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.

04.04 Distinguish fact from opinion.

04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.

04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.

04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.

04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.

04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.

04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.

04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.

04.14 Use the mathematics of:

- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT THE USE AND CARE OF DRAFTING INSTRUMENTS, EQUIPMENT, AND MATERIALS--The student will be able to:

12.01 Identify and demonstrate technical knowledge and skills about the use and care of drafting instruments.
12.02 Identify and demonstrate technical knowledge and skills about the use and care of drafting equipment.
12.03 Demonstrate technical knowledge and skills about the properties, specifications, and use of drafting materials and supplies.

13.0 DEMONSTRATE TECHNICAL SKILLS AND APPLICATIONS COMMON TO ALL TYPES OF DRAFTING--The student will be able to:

13.01 Use proper drafting symbols and alphabet of lines in accordance with technical standards and practices.
13.02 Apply proper lettering techniques.
13.03 Apply geometric construction techniques.
13.04 Interpret information from drawings, prints, and sketches.
13.05 Make freehand sketches.
13.06 Produce and reproduce drawings using modern technical methods for drafting reproduction.

14.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING ORTHOGRAPHIC DRAWINGS--The student will be able to:

14.01 Explain the theory of orthographic projection.
14.02 Identify the six principal views of an object.
14.03 Produce a three-view orthographic drawing.
14.04 Produce a CAD generated three-view orthograhic drawing.

15.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING PICTORIAL DRAWINGS--The student will be able to:

15.01 Explain methods of pictorial drawing.
15.02 Produce an isometric drawing.
15.03 Produce a CAD generated isometric drawing.
15.04 Produce a oblique drawing.
15.05 Produce a CAD generated oblique drawing.
15.06 Produce a perspective drawing.

16.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING AUXILIARY VIEW DRAWINGS--The student will be able to:

16.01 Describe the terms normal view, inclined surface, and skewed surface.
16.02 Produce an auxiliary view drawing.
16.03 Produce a CAD auxiliary view drawing.

17.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING SECTIONAL VIEW DRAWINGS--The student will be able to:

17.01 Define sectional view.
17.02 Describe types of sectional views.
17.03 Illustrates the types of breaks and symbols used in drawing sectional views.
17.04 Produce a sectional view drawing.
17.05 Produce a CAD generated sectional view drawing.

18.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING ENGINEERING DRAWINGS--The student will be able to:

18.01 Produce detailed machine drawings with tolerances, cams, gears, hidden surfaces and other mechanical details.

18.02 Produce detailed assembly drawings with screws, keys, rivets, welded joints, and other assembly details.

18.03 Produce detailed electronic schematics with circuits, power sources, controls, and other electronic components.

19.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING ARCHITECTURAL DRAWING--The student will be able to:

19.01 Produce dimensional floor plan drawings showing walls, windows, doors, cabinets, stairs, appliances, fixtrures, and other details.

19.02 Produce dimensional elevation drawings showing grade lines, floors, ceilings, windows, doors, and other details.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600820
Course Title: Drafting/Illustrative Design Technology II
Course Credit: 1

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations, and technical skills of drafting technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.

04.16 Use elementary concepts of probability and statistics.

04.17 Draw, read, and analyze graphs, charts, and tables.

04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.

04.19 Organize and communicate the results obtained by observation and experimentation.

04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).

04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.

05.03 Design and implement the optimal solution to a given problem.

05.04 Document each step of the design/problem-solving process.

05.05 Demonstrate "brainstorming" as a process to solve problems.

05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.

06.02 Explore methods used to monitor and correct performance of technological systems.

06.03 Design and implement an optimal solution to a given problem.

06.04 Outline major historical technological developments or events.

06.05 Identify recent advances in technology.

06.06 Explain problem-solving roles of technology.

06.07 Forecast a technological development or event.

06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.

07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.

07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.

07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

20.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING ORTHOGRAPHIC DRAWINGS--The student will be able to:

20.01 Identify the six principal views of an object.
20.02 Produce a three-view orthographic drawing.
20.03 Produce a CAD generated three-view orthograhic drawing.

21.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING PICTORIAL DRAWINGS--The student will be able to:

21.01 Explain methods of pictorial drawings.
21.02 Produce an advanced isometric drawing.
21.03 Produce a CAD generated advanced isometric drawing.

21.04 Produce and advanced oblique drawing.
21.05 Produce a CAD generated advanced oblique drawing.

22.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING SECTIONAL VIEW DRAWINGS--The student will be able to:

22.01 Define sectional view.
22.02 Produce an advanced sectional view drawing.
22.03 Produce a CAD generated advance sectional view.

23.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING ENGINEERING DRAWINGS--The student will be able to:

23.01 Produce an advanced detailed machine drawings with tolerances, cams, gears, hidden surfaces and other mechanical details.
23.02 Produce a CAD generated advanced detailed machine drawing.

24.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING ARCHITECTURAL DRAWINGS--The student will be able to:

24.01 Produce dimensioned floor plan drawings showing walls, windows, doors, cabinets, stairs, appliances, fixtures, and other details.
24.02 Produce a CAD generated dimensional floor plan.
24.03 Produce dimensional elevation drawings showing grade lines, floors, ceilings, windows, doors, and other details.
24.04 Produce a CAD generated dimensional elevation drawing.
24.05 Produce a dimensional architectural electrical plan.
24.06 Produce a CAD generated dimensional electrical plan.
24.07 Produce a dimensional architectural plumbing plan.
24.08 Produce a CAD generated dimensional architectural plumbing plan.
24.09 Produce a dimensional architectural climate control plan.
24.10 Produce a CAD generated dimensional climate control plan.
24.11 Produce a dimensional landscape plan for a construction site.
24.12 Produce a CAD generated dimensional landscape plan.

25.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING TECHNICAL ILLUSTRATIONS--The student will be able to:

25.01 Produce a colored or shaded pictorial rendering for presentation.
25.02 Produce a labeled graph or chart for display.
25.03 Produce a dimensioned map or topographic drawing of land, sea, or air boundaries.

26.0 DEMONSTRATE BASIC TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING A COMPUTER ASSISTED DRAWING (CAD)--The student will be able to:

26.01 Apply basic knowledge and skills of drafting on CAD systems by completing assigned drawings in either the engineering, architectural, or technical illustrations classification.
26.02 Plot a drawing generated by CAD.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600830
Course Title: Drafting/Illustrative Design Technology III
Course Credit: 1

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations, and technical skills of drafting technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.

03.02 Identify and describe methods of information acquisition and evalution.

03.03 Discuss advantages and disadvantages in the application of technologies.

03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.

03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.

04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.

04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.

04.04 Distinguish fact from opinion.

04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.

04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.

04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.

04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.

04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.

04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.

04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.

04.14 Use the mathematics of:
- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

27.0 PERFORM ADVANCED STUDY AND TECHNICAL SKILLS RELATED TO DRAFTING TECHNOLOGY--The student will be able to:

27.01 Select an individual or group project in cooperation with the teacher.
27.02 Develop a written plan of work to carry out the project.
27.03 Show evidence of technical study in support of the project.
27.04 Perform skills related to the project.
27.05 Complete the project as planned.

28.0 OPERATE A COMPUTER UTILIZING A PROGRAM RELATED TO DRAFTING TECHNOLOGY--The student will be able to:

28.01 Collect or produce data on drafting technology through the operation of a computer.

29.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT MODELING AS A DRAFTING AID--The student will be able to:

29.01 Demonstrate the technical skills of producing a clay, wax, wood, plastic, or cardboard scale model.
29.02 Build a scale model to represent an architectural design, prototype design, plot-plan, route layout, equipment design, or equipment arrangement.
29.03 Demonstrate the use of photography in producing or presenting model photo drawings.

30.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT THE FUNDAMENTALS OF DESIGN AND DESIGN PROCEDURES--The student will be able to:

30.01 Describe the basic principles and functions of good design.
30.02 Outline steps and procedures followed in the design of a product.
30.03 Demonstrate ways in which designs are presented to manufacturers and to customers.
30.04 Develop a variety of designs using conventional methods and a CAD system.

31.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON DRAFTING TECHNOLOGY--The student will be able to:

31.01 Identify a problem.
31.02 State a need to research the problem.
31.03 Form a hypothesis about the problem.
31.04 Plan the procedures of researching the problem.
31.05 Conduct the research following the planned procedures.
31.06 Present the research findings in a seminar.
31.07 State conclusions based on the research findings.

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Electronics Technology
Occupational Area:	Technology Education
	Secondary
Program Numbers	**8600900**
CIP Number	0821.010400
Grade Level	9-12, 30, 31
Length	3 credits
Certification	INDUS ARTS @4 @6 ELECTRONIC @7G TEC ELEC @7G GEN SHOP @4 ELECTRICAL @4 @7G I ART-TEC 1 @2

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this program is to provide students with a foundation of knowledge and technically oriented experiences in the study of electronics technology. This program focuses on transferable skills and stresses understanding and demonstration of the technological tools, machines, instruments, materials, processes and systems in business and industry.

The content includes, but is not limited to, the theory, use, and technical application of electronics technology. The content and activities will also include the study of entrepreneurship, safety, and leadership skills.

Listed below are the courses that make up this program. Design code 241 is the appropriate laboratory facility for this program.

8600910 - Electronics Technology I
8600920 - Electronics Technology II
8600930 - Electronics Technology III

II. **LABORATORY ACTIVITIES**: Instruction and learning activities are provided in a laboratory setting using hands-on experiences with the tools and materials appropriate to the course content.

III. **SPECIAL NOTE**: The Florida Technology Student Association (FL-TSA)is the appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. Vocational student organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

The Level II and Level III courses in this program may articulate into postsecondary Tech-Prep 2 + 2 programs when taken in sequence. Tech-

Prep 2 + 2 programs require articulation agreements between secondary and postsecondary educational agencies.

In accordance with HB 2489 - Section 42, approved by the Florida Legislature and signed into law June 16, 1995, Technology Education students who have completed a minimum of three sequential credits in an eligible technology education program by the end of school year 1995-96 and thereafter will be eligible for the Gold Seal designation. The student must also continue in a planned, related post secondary education program.

IV. **INTENDED OUTCOMES:** After successfully completing this program, the student will be able to:

01.0 Demonstrate the ability to work safely with a variety of technologies.
02.0 Demonstrate interpersonal skills as they relate to the workplace.
03.0 Identify and apply methods of information acquisition and utilization.
04.0 Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05.0 Demonstrate and apply design/problem-solving processes.
06.0 Express an understanding of technological systems and their complex interrelationships.
07.0 Demonstrate the ability to properly identify, organize, plan, and allocate resources.
08.0 Discuss individual interests and aptitudes as they relate to a career.
09.0 Demonstrate employability skills.
10.0 Demonstrate an understanding of entrepreneurship.
11.0 Make an informed and meaningful career choice.
12.0 Describe the structure of matter related to electronics.
13.0 Describe, construct, conduct, and analyze experiments with basic DC and AC circuits and with circuits using magnetism.
14.0 Identify, measure, and describe the function of transformers and inductors in electronic circuits.
15.0 Use Ohm's law and Watt's law to analyze and experiment with resistive circuits.
16.0 Describe, construct, analyze, and experiment with capacitive circuits.
17.0 Demonstrate the use of electronic equipment.
18.0 Demonstrate proper electronic assembly methods.
19.0 Demonstrate an understanding of basic electrical circuits and electronic systems.
20.0 Describe the structure of matter related to electronics.
21.0 Describe, construct, conduct, and analyze experiments with basic DC and AC circuits and with circuits using magetism.
22.0 Identify, measure, and describe the function of transformers and inductors in electronic circuits.
23.0 Use Ohm's law and Watt's law to analyze and experiment with resistive circuits.
24.0 Describe, construct, analyze, and experiment with capacitive circuits

25.0 Describe and experiment with integrated circuits.

26.0 Demonstrate the use of electronic equipment.

27.0 Demonstrate an understanding of basic electrical circuits and electronic systems.

28.0 Describe, conduct, and experiment with circuits using semiconductors.

29.0 Perform advanced study and skills related to electronics technology.

30.0 Demonstrate an understanding of the principles and applications of microcomputer systems.

31.0 Describe, identify, and correct problems in electronic circuits.

32.0 Demonstrate technical knowledge and skills about electronic networks and systems.

33.0 Conduct a research and experimentation project on an electronic system or process.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Electronics Technology
Secondary Number: 8600900
Postsecondary Number:

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.

03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.

04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume, work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.

BEST COPY AVAILABLE

08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 DESCRIBE THE STRUCTURE OF MATTER RELATED TO ELECTRONICS--The student will be able to:

12.01 Describe the composition of elements, mixtures, and compounds according to the electron theory.
12.02 List the atomic subparticles.
12.03 Diagram and show the relationship between electrons, protons, and neutrons.
12.04 State the law of electrical charges.
12.05 Describe the classification and characteristics of materials as they apply to conductor, insulators, and semiconductors.
12.06 Demonstrate proficiency in the identification of electronics symbols.

13.0 DESCRIBE, CONSTRUCT, CONDUCT, AND ANALYZE EXPERIMENTS WITH BASIC DC AND AC CIRCUITS AND WITH CIRCUITS USING MAGNETISM--The student will be able to:

13.01 Solve math problems related to DC and AC circuits.
13.02 Define voltage, current, resistance, power, and energy.

13.03 Set up and test basic circuits.
13.04 Set up and operate multimeters in DC and AC circuits.
13.05 Set up and operate power supplies in DC circuits.
13.06 Describe magnetism, the law of magnetic poles, and the behavior of flux lines.
13.07 Demonstrate electromagnetism.
13.08 Construct simple circuits using a relay.

14.0 IDENTIFY, MEASURE, AND DESCRIBE THE FUNCTION OF TRANSFORMERS AND INDUCTORS IN ELECTRONIC CIRCUITS--The student will be able to:

14.01 Explain the theory of operation and application of inductance in inductors and transformers.
14.02 Explain what an inductor is and what its purpose is.
14.03 Construct circuits using transformers and inductors.
14.04 Explain inductive reactance.

15.0 USE OHM'S LAW AND WATT'S LAW TO ANALYZE AND EXPERIMENT WITH RESISTIVE CIRCUITS--The student will be able to:

15.01 Identify resistors by color code.
15.02 Identify and measure resistors.
15.03 Apply Ohm's law to circuits.
15.04 Explain how resistors are constructed.
15.05 Apply Watt's law to circuits.
15.06 Use a VOM to verify values.
15.07 Identify different types of resistors, and explain their use and ratings.

16.0 DESCRIBE, CONSTRUCT, ANALYZE AND EXPERIMENT WITH CAPACITIVE CIRCUITS--The student will be able to:

16.01 Explain how a capacitor stores electrical energy.
16.02 Explain how a capacitor is constructed.
16.03 Explain capacitive reactance.

17.0 DEMONSTRATE THE USE OF ELECTRONIC EQUIPMENT--The student will be able to:

17.01 Use a VOM to obtain accurate measurements.
17.02 Apply safety rules in the use of electronci instruments and demonstrate proper care and maintenance for the equipment during storage and use.
17.03 Use voltmeters, ammeters, and ohmmeters to obtain accurate measurements.
17.04 Set up and use an oscilloscope to observe waveforms and to determine the voltage of the signal presented.
17.05 Use signal generators to produce waveforms of selected frequencies and shapes.
17.06 Use testers to determine the condition of electronic components.

18.0 DEMONSTRATE PROPER ELECTRONIC ASSEMBLY METHODS--The student will be able to:

18.01 Exhibit safe soldering techniques.
18.02 Identify proper soldering practices.
18.03 Demonstrate proper soldering applications.
18.04 Identify common electrical and electronics hand tools.
18.05 Demonstrate electronic component assembly.
18.06 Apply electrical tape to a spliced and soldered wire connection.
18.07 Solder and desolder components and wires.
18.08 Describe the two methods of making a printed circuit board.

19.0 DEMONSTRATE AN UNDERSTANDING OF BASIC ELECTRICAL CIRCUITS AND ELECTRONIC SYSTEMS--The student will be able to:

19.01 Identify problems and demonstrate appropriate solutions when dealing with series, series-parallel, parallel, voltage dividers, and network circuits.
19.02 Define electronic systems.
19.03 Describe the importance of electronic systems in today's technology world.
19.04 Define electronics input, process and output of electronic systems.
19.05 Conduct electronic experiments using input, process and output systems.
19.06 Describe, design and conduct experiments with electronic systems.

20.0 DESCRIBE THE STRUCTURE OF MATTER RELATED TO ELECTRONICS--The student will be able to:

20.01 Describe the composition of element, mixtures, and compounds according to the electron theory.
20.02 List the atomic subparticles.
20.03 Diagram and show the relationship between electrons, protons, and neutrons.
20.04 State the law of electrical charges.
20.05 Describe the classification and characteristics of materials as they apply to conductors, insulators, and semiconductors.
20.06 Demonstrate proficiency in the identification of electronics symbols.

21.0 DESCRIBE, CONSTRUCT, CONDUCT, AND ANALYZE EXPERIMENTS WITH BASIC DC AND AC CIRCUITS AND WITH CIRCUITS USING MAGNETISM--The student will be able to:

21.01 Solve electronic math problems related to DC and AC circuits.
21.02 Define voltage, current, resistance, power, and energy.
21.03 Set up and test basic circuits.
21.04 Set up and operate multimeters in DC and AC circuits.
21.05 Set up and operate power supplies in DC circuits.
21.06 Describe magnetism, the law of magnetic poles, and the behavior of flux lines.
21.07 Demonstrate electromagnetism.
21.08 Construct simple circuits using a relay.

22.0 IDENTIFY, MEASURE, AND DESCRIBE THE FUNCTION OF TRANSFORMERS AND INDUCTORS IN ELECTRONIC CIRCUITS--The student will be able to:

22.01 Explain the theory of operation and application of inductance in inductors and transformers.
22.02 Explain what an inductor is and what its purpose is.
22.03 Construct circuits using transformers and inductors.
22.04 Explain inductive reactance.

23.0 USE OHM'S LAW AND WATT'S LAW TO ANALYZE AND EXPERIMENT WITH RESISTIVE CIRCUITS--The student will be able to:

23.01 Identify resistors by color code.
23.02 Identify and measure resistors.
23.03 Apply Ohm's law to circuits.
23.04 Explain how resistors are constructed.
23.05 Apply Watt's law to circuits.
23.06 Use a VOM to verify values.
23.07 Identify different types of resistors, and explain their use ratings.

24.0 DESCRIBE, CONSTRUCT, ANALYZE AND EXPERIMENT WITH CAPACITIVE CIRCUITS--The student will be able to:

24.01 Explain how a capacitor stores electrical energy.
24.02 Explain how a capacitor is constructed.
24.03 Explain capacitive reactance.

25.0 DESCRIBE AND EXPERIMENT WITH INTEGRATED CIRCUITS--The student will be able to:

25.01 Explain what integrated circuits (IC's) are and how they are manufactured.
25.02 Explain the advantages of integrated circuits as compared to discrete component circuits.
25.03 Construct electronic circuits which contain ICs.
25.04 Describe the basic types of integrated circuit design, along with their pin numbering systems and dimensions.

26.0 DEMONSTRATE THE USE OF ELECTRONIC EQUIPMENT--The student will be able to:

26.01 Use a VOM to obtain accurate measurements.
26.02 Apply safety rules in the use of electronic instruments and demonstrate proper care and maintenance for the equipment during storage and use.
26.03 Use voltmeters, ammeters, and ohmmeters to obtain accurate measurements.
26.04 Set up and use an oscilloscope to observe waveforms and to determine the voltage of the signal presented.
26.05 Use signal generators to produce waveforms of selected frequencies and shapes.

26.06 Use testers to determine the condition of electronic components.

27.0 DEMONSTRATE AN UNDERSTANDING OF BASIC ELECTRICAL CIRCUITS AND ELECTRONIC SYSTEMS--The student will be able to:

27.01 Identify problems and demonstrate appropriate solutions when dealing with series, series-parallel, parallel, voltage dividers, and network circuits.
27.02 Define electronic systems.
27.03 Describe the importance of electronic systems in today's technology world.
27.04 Define electronic input, process and output of electronic systems.
27.05 Conduct electronic experiments using input, process and output systems.
27.06 Describe, design and conduct experiments with electronic systems.
27.07 Define and give an example of a super conductor.

28.0 DESCRIBE, CONSTRUCT, AND EXPERIMENT WITH CIRCUITS USING SEMICONDUCTORS--The student will be able to:

28.01 Describe the general theory and application of semiconductor devices.
28.02 Explain the difference between N-type and P-type material.
28.03 Explain the precautions necessary when working with solid state devices.
28.04 Demonstrate the proper procedures for the installation of solid state components using thermal release devices (heat sinks).
28.05 Construct and experiment with semiconductor devices.
28.06 Construct and test circuits which contain solid state components such as FET'S, SCR's, UJT's, tunnel diodes, zener diodes, light emitting diodes, etc.

29.0 PERFORM ADVANCED STUDY AND SKILLS RELATED TO ELECTRONICS--The student will be able to:

29.01 Select an individual or group project in cooperation with the teacher.
29.02 Develop a written plan of work to carry out the project.
29.03 Show evidence of technical study in support of the project.
29.04 Perform skills related to the project.
29.05 Complete the project as planned.

30.0 DEMONSTRATE AN UNDERSTANDING OF THE PRINCIPLES AND APPLICATIONS OF MICROCOMPUTER SYSTEMS--The student will be able to:

30.01 Define microcomputer systems.
30.02 Describe the importance of microcomputer systems in today's technology world.
30 03 Describe microcomputer applications in today's technology world.
30.04 Define microcomputer interfacing.

30.05 Conduct microcomputer systems experiments.
30.06 Conduct microcomputer systems interfacing, sensing and control applications.

31.0 DESCRIBE, IDENTIFY, AND CORRECT PROBLEMS IN ELECTRONIC CIRCUITS--The student will be able to:

31.01 Identify problems and demonstrate solutions when dealing with power supplies, oscillators, and amplifiers.

32.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT ELECTRONIC NETWORKS AND SYSTEMS--The student will be able to:

32.01 Define and describe telecommunications.
32.02 Conduct telecommunications experiments including receivers, transmitters, wirelines and antennas, telephones and fiber optics.
32.03 Describe the technology and organization of electronic guidance systems.
32.04 Perform technical skills in building, assembling, servicing, or operating one of the above systems.
32.05 Define and describe logic control.
32.06 Conduct a logic control experiment.
32.07 Define and describe digital communications.
32.08 Conduct a digital communications experiment.
32.09 Define and describe industrial controls.
32.10 Conduct an industrial controls experiment.

33.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON AN ELECTRONIC SYSTEM OR PROCESS--The student will be able to:

33.01 Identify a problem.
33.02 State a need to research the problem.
33.03 Form a hypothesis about the problem.
33.04 Plan the procedures for researching the problem.
33.05 Conduct the research following the planned procedures.
33.06 Present the research findings in a seminar.
33.07 State conclusions based on the research findings.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600910
Course Title: Electronics Technology I
Course Credit: 1

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations, and technical skills of electronics technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.

03.02 Identify and describe methods of information acquisition and evalution.

03.03 Discuss advantages and disadvantages in the application of technologies.

03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.

03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.

04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.

04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.

04.04 Distinguish fact from opinion.

04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.

04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.

04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.

04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.

04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.

04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.

04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.

04.14 Use the mathematics of:

- **integers, fractions, and decimals;**
- **ratios, proportions, and percentages;**
- **roots and powers;**
- **algebra;**
- **geometry.**

04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

BEST COPY AVAILABLE

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 DESCRIBE THE STRUCTURE OF MATTER RELATED TO ELECTRONICS--The student will be able to:

12.01 Describe the composition of elements, mixtures, and compounds according to the electron theory.
12.02 List the atomic subparticles.
12.03 Diagram and show the relationship between electrons, protons, and neutrons.
12.04 State the law of electrical charges.
12.05 Describe the classification and characteristics of materials as they apply to conductor, insulators, and semiconductors.
12.06 Demonstrate proficiency in the identification of electronics symbols.

13.0 DESCRIBE, CONSTRUCT, CONDUCT, AND ANALYZE EXPERIMENTS WITH BASIC DC AND AC CIRCUITS AND WITH CIRCUITS USING MAGNETISM--The student will be able to:

- 13.01 Solve math problems related to DC and AC circuits.
- 13.02 Define voltage, current, resistance, power, and energy.
- 13.03 Set up and test basic circuits.
- 13.04 Set up and operate multimeters in DC and AC circuits.
- 13.05 Set up and operate power supplies in DC circuits.
- 13.06 Describe magnetism, the law of magnetic poles, and the behavior of flux lines.
- 13.07 Demonstrate electromagnetism.
- 13.08 Construct simple circuits using a relay.

14.0 IDENTIFY, MEASURE, AND DESCRIBE THE FUNCTION OF TRANSFORMERS AND INDUCTORS IN ELECTRONIC CIRCUITS--The student will be able to:

- 14.01 Explain the theory of operation and application of inductance in inductors and transformers.
- 14.02 Explain what an inductor is and what its purpose is.
- 14.03 Construct circuits using transformers and inductors.
- 14.04 Explain inductive reactance.

15.0 USE OHM'S LAW AND WATT'S LAW TO ANALYZE AND EXPERIMENT WITH RESISTIVE CIRCUITS--The student will be able to:

- 15.01 Identify resistors by color code.
- 15.02 Identify and measure resistors.
- 15.03 Apply Ohm's law to circuits.
- 15.04 Explain how resistors are constructed.
- 15.05 Apply Watt's law to circuits.
- 15.06 Use a VOM to verify values.
- 15.07 Identify different types of resistors, and explain their use and ratings.

16.0 DESCRIBE, CONSTRUCT, ANALYZE AND EXPERIMENT WITH CAPACITIVE CIRCUITS--The student will be able to:

- 16.01 Explain how a capacitor stores electrical energy.
- 16.02 Explain how a capacitor is constructed.
- 16.03 Explain capacitive reactance.

17.0 DEMONSTRATE THE USE OF ELECTRONIC EQUIPMENT--The student will be able to:

- 17.01 Use a VOM to obtain accurate measurements.
- 17.02 Apply safety rules in the use of electronci instruments and demonstrate proper care and maintenance for the equipment during storage and use.
- 17.03 Use voltmeters, ammeters, and ohmmeters to obtain accurate measurements.
- 17.04 Set up and use an oscilloscope to observe waveforms and to determine the voltage of the signal presented.

17.05 Use signal generators to produce waveforms of selected frequencies and shapes.
17.06 Use testers to determine the condition of electronic components.

18.0 DEMONSTRATE PROPER ELECTRONIC ASSEMBLY METHODS--The student will be able to:

18.01 Exhibit safe soldering techniques.
18.02 Identify proper soldering practices.
18.03 Demonstrate proper soldering applications.
18.04 Identify common electrical and electronics hand tools.
18.05 Demonstrate electronic component assembly.
18.06 Apply electrical tape to a spliced and soldered wire connection.
18.07 Solder and desolder components and wires.
18.08 Describe the two methods of making a printed circuit board.

19.0 DEMONSTRATE AN UNDERSTANDING OF BASIC ELECTRICAL CIRCUITS AND ELECTRONIC SYSTEMS--The student will be able to:

19.01 Identify problems and demonstrate appropriate solutions when dealing with series, series-parallel, parallel, voltage dividers, and network circuits.
19.02 Define electronic systems.
19.03 Describe the importance of electronic systems in today's technology world.
19.04 Define electronics input, process and output of electronic systems.
19.05 Conduct electronic experiments using input, process and output systems.
19.06 Describe, design and conduct experiments with electronic systems.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600920
Course Title: Electronics Technology II
Course Credit: 1

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations, and technical skills of electronics technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  - integers, fractions, and decimals;
  - ratios, proportions, and percentages;
  - roots and powers;
  - algebra;
  - geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

20.0 DESCRIBE THE STRUCTURE OF MATTER RELATED TO ELECTRONICS--The student will be able to:

20.01 Describe the composition of element, mixtures, and compounds according to the electron theory.
20.02 List the atomic subparticles.
20.03 Diagram and show the relationship between electrons, protons, and neutrons.
20.04 State the law of electrical charges.
20.05 Describe the classification and characteristics of materials as they apply to conductors, insulators, and semiconductors.
20.06 Demonstrate proficiency in the identification of electronics symbols.

21.0 DESCRIBE, CONSTRUCT, CONDUCT, AND ANALYZE EXPERIMENTS WITH BASIC DC AND AC CIRCUITS AND WITH CIRCUITS USING MAGNETISM--The student will be able to:

21.01 Solve electronic math problems related to DC and AC circuits.
21.02 Define voltage, current, resistance, power, and energy.
21.03 Set up and test basic circuits.
21.04 Set up and operate multimeters in DC and AC circuits.
21.05 Set up and operate power supplies in DC circuits.
21.06 Describe magnetism, the law of magnetic poles, and the behavior of flux lines.
21.07 Demonstrate electromagnetism.
21.08 Construct simple circuits using a relay.

22.0 IDENTIFY, MEASURE, AND DESCRIBE THE FUNCTION OF TRANSFORMERS AND INDUCTORS IN ELECTRONIC CIRCUITS--The student will be able to:

22.01 Explain the theory of operation and application of inductance in inductors and transformers.
22.02 Explain what an inductor is and what its purpose is.
22.03 Construct circuits using transformers and inductors.
22.04 Explain inductive reactance.

23.0 USE OHM'S LAW AND WATT'S LAW TO ANALYZE AND EXPERIMENT WITH RESISTIVE CIRCUITS--The student will be able to:

23.01 Identify resistors by color code.
23.02 Identify and measure resistors.
23.03 Apply Ohm's law to circuits.
23.04 Explain how resistors are constructed.
23.05 Apply Watt's law to circuits.
23.06 Use a VOM to verify values.
23.07 Identify different types of resistors, and explain their use ratings.

24.0 DESCRIBE, CONSTRUCT, ANALYZE AND EXPERIMENT WITH CAPACITIVE CIRCUITS--The student will be able to:

24.01 Explain how a capacitor stores electrical energy.
24.02 Explain how a capacitor is constructed.
24.03 Explain capacitive reactance.

25.0 DESCRIBE AND EXPERIMENT WITH INTEGRATED CIRCUITS--The student will be able to:

25.01 Explain what integrated circuits (IC's) are and how they are manufactured.
25.02 Explain the advantages of integrated circuits as compared to discrete component circuits.
25.03 Construct electronic circuits which contain ICs.
25.04 Describe the basic types of integrated circuit design, along with their pin numbering systems and dimensions.

26.0 DEMONSTRATE THE USE OF ELECTRONIC EQUIPMENT--The student will be able to:

26.01 Use a VOM to obtain accurate measurements.
26.02 Apply safety rules in the use of electronic instruments and demonstrate proper care and maintenance for the equipment during storage and use.
26.03 Use voltmeters, ammeters, and ohmmeters to obtain accurate measurements.
26.04 Set up and use an oscilloscope to observe waveforms and to determine the voltage of the signal presented.
26.05 Use signal generators to produce waveforms of selected frequencies and shapes.
26.06 Use testers to determine the condition of electronic components.

27.0 DEMONSTRATE AN UNDERSTANDING OF BASIC ELECTRICAL CIRCUITS AND ELECTRONIC SYSTEMS--The student will be able to:

27.01 Identify problems and demonstrate appropriate solutions when dealing with series, series-parallel, parallel, voltage dividers, and network circuits.
27.02 Define electronic systems.
27.03 Describe the importance of electronic systems in today's technology world.
27.04 Define electronic input, process and output of electronic systems.
27.05 Conduct electronic experiments using input, process and output systems.
27.06 Describe, design and conduct experiments with electronic systems.
27.07 Define and give an example of a super conductor.

28.0 DESCRIBE, CONSTRUCT, AND EXPERIMENT WITH CIRCUITS USING SEMICONDUCTORS--The student will be able to:

28.01 Describe the general theory and application of semiconductor devices.
28.02 Explain the difference between N-type and P-type material.
28.03 Explain the precautions necessary when working with solid state devices.
28.04 Demonstrate the proper procedures for the installation of solid state components using thermal release devices (heat sinks).
28.05 Construct and experiment with semiconductor devices.
28.06 Construct and test circuits which contain solid state components such as FET'S, SCR's, UJT's, tunnel diodes, zener diodes, light emitting diodes, etc.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8600930
Course Title: Electronics Technology III
Course Credit: 1

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations, and technical skills of electronics technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  - integers, fractions, and decimals;
  - ratios, proportions, and percentages;
  - roots and powers;
  - algebra;
  - geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

29.0 PERFORM ADVANCED STUDY AND SKILLS RELATED TO ELECTRONICS--The student will be able to:

29.01 Select an individual or group project in cooperation with the teacher.
29.02 Develop a written plan of work to carry out the project.
29.03 Show evidence of technical study in support of the project.
29.04 Perform skills related to the project.
29.05 Complete the project as planned.

30.0 DEMONSTRATE AN UNDERSTANDING OF THE PRINCIPLES AND APPLICATIONS OF MICROCOMPUTER SYSTEMS--The student will be able to:

30.01 Define microcomputer systems.

30.02 Describe the importance of microcomputer systems in today's technology world.
30.03 Describe microcomputer applications in today's technology world.
30.04 Define microcomputer interfacing.
30.05 Conduct microcomputer systems experiments.
30.06 Conduct microcomputer systems interfacing, sensing and control applications.

31.0 DESCRIBE, IDENTIFY, AND CORRECT PROBLEMS IN ELECTRONIC CIRCUITS--The student will be able to:

31.01 Identify problems and demonstrate solutions when dealing with power supplies, oscillators, and amplifiers.

32.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT ELECTRONIC NETWORKS AND SYSTEMS--The student will be able to:

32.01 Define and describe telecommunications.
32.02 Conduct telecommunications experiments including receivers, transmitters, wirelines and antennas, telephones and fiber optics.
32.03 Describe the technology and organization of electronic guidance systems.
32.04 Perform technical skills in building, assembling, servicing, or operating one of the above systems.
32.05 Define and describe logic control.
32.06 Conduct a logic control experiment.
32.07 Define and describe digital communications.
32.08 Conduct a digital communications experiment.
32.09 Define and describe industrial controls.
32.10 Conduct an industrial controls experiment.

33.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON AN ELECTRONIC SYSTEM OR PROCESS--The student will be able to:

33.01 Identify a problem.
33.02 State a need to research the problem.
33.03 Form a hypothesis about the problem.
33.04 Plan the procedures for researching the problem.
33.05 Conduct the research following the planned procedures.
33.06 Present the research findings in a seminar.
33.07 State conclusions based on the research findings.

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Materials and Processes Technology
Occupational Area:	Technology Education
	Secondary
Program Numbers	**8601100**
CIP Number	0821.010700
Grade Level	9-12, 30, 31
Length	3 credits
Certification	INDUS ARTS @4 @6 WOODWORK @4 METALS @4 GEN SHOP @4 I ART-TEC 1 @2

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this program is to provide students with a foundation of knowledge and technically oriented experiences in the study of the technology of materials and processes. This program focuses on transferable skills and stresses understanding and demonstration of the technological tolls, machines, instruments, materials, processes and systems in business and industry.

The content includes, but is not limited to, a study of the preprocessing, processing, and postprocessing of wood, metal, plastic, composite, and other materials. The content and activities will also include the study of entrepreneurship, safety, and leadership skills.

Listed below are the courses that make up this program. Design code 243 is the appropriate laboratory facility for this program.

8601110 - Materials and Processes Technology I
8601120 - Materials and Processes Technology II
8601130 - Materials and Processes Technology III

II. **LABORATORY ACTIVITIES**: Instruction and learning activities are provided in a laboratory setting using hands-on experiences with the tools and materials appropriate to the course content.

III. **SPECIAL NOTE**: The Florida Technology Student Association (FL-TSA)is the appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. Vocational student organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

The Intermediate and Advance courses in this program may articulate into postsecondary Tech-Prep 2 + 2 programs when taken in sequence. Tech-Prep 2 + 2 programs require articulation agreements between secondary and postsecondary educational agencies.

In accordance with HB 2489 - Section 42, approved by the Florida Legislature and signed into law June 16, 1995, Technology Education students who have completed a minimum of three sequential credits in an eligible technology education program by the end of school year 1995-96 and thereafter will be eligible for the Gold Seal designation. The student must also continue in a planned, related post secondary education program.

IV. **INTENDED OUTCOMES:** After successfully completing this program, the student will be able to:

01.0 Demonstrate the ability to work safely with a variety of technologies.

02.0 Demonstrate interpersonal skills as they relate to the workplace.

03.0 Identify and apply methods of information acquisition and utilization.

04.0 Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.

05.0 Demonstrate and apply design/problem-solving processes.

06.0 Express an understanding of technological systems and their complex interrelationships.

07.0 Demonstrate the ability to properly identify, organize, plan, and allocate resources.

08.0 Discuss individual interests and aptitudes as they relate to a career.

09.0 Demonstrate employability skills.

10.0 Demonstrate an understanding of entrepreneurship.

11.0 Make an informed and meaningful career choice.

12.0 Define the processes related to materials technology.

13.0 Describe preprocessing activities and practices of materials technology.

14.0 Describe processing technologies and practices of industrial materials.

15.0 Describe postprocessing activities and practices of industrial materials.

16.0 Perform industrial materials preprocessing skills.

17.0 Perform technical processing skills with wood materials.

18.0 Perform technical processing skills with metal materials.

19.0 Perform technical processing skills with plastic materials.

20.0 Perform technical processing skills with other industrial materials such as composite materials, synthetic materials, fiberglass, glass, ceramics, cement, paper, rubber, petroleum, polymers and other industrial materials.

21.0 Perform industrial materials postprocessing skills.

22.0 Operate a computer utilizing a program related to industrial materials.

23.0 Perform advanced study and technical skills related to materials and processes.

24.0 Operate a computer utilizing a program related to industrial materials.

25.0 Perform materials testing skills.

26.0 Perform a materials processing operation using a CNC (computer numerical controlled) machine.

27.0 Conduct a research and experimentation project on a material or process.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Materials And Processes Technology
Secondary Number: 8601100
Postsecondary Number:

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.

03.03 Discuss advantages and disadvantages in the application of technologies.

03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.

03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.

04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.

04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.

04.04 Distinguish fact from opinion.

04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.

04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.

04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.

04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.

04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.

04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.

04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.

04.14 Use the mathematics of:
- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.

04.16 Use elementary concepts of probability and statistics.

04.17 Draw, read, and analyze graphs, charts, and tables.

04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 DEFINE THE PROCESSES RELATED TO INDUSTRIAL MATERIALS--The student will be able to:

12.01 Define "preprocessing."
12.02 Define "processing."
12.03 Define "postprocessing."

13.0 DESCRIBE PREPROCESSING ACTIVITIES AND PRACTICES--The student will be able to:

13.01 Describe the technical processes of extracting materials from natural resources.
13.02 Describe sources of standard stock materials.
13.03 Describe processes for transporting industrial materials.
13.04 Describe processes for storing industrial materials.
13.05 Describe industrial processes for protecting materials.

13.06 Describe precautions in receiving, unpacking, and handling industrial materials.

14.0 DESCRIBE PROCESSING TECHNOLOGIES AND PRACTICES OF INDUSTRIAL MATERIALS--The student will be able to:

14.01 Describe materials separating processes.
14.02 Describe materials forming processes.
14.03 Describe materials combining processes.
14.04 Describe materials conditioning processes.

15.0 DESCRIBE POSTPROCESSING TECHNOLOGIES AND PRACTICES OF INDUSTRIAL MATERIALS--The student will be able to:

15.01 Describe processes for distributing products made of industrial materials.
15.02 Describe processes for installing products made of industrial materials.
15.03 Describe processes for maintaining products made of industrial materials.
15.04 Describe processes for altering products made of industrial materials.
15.05 Describe processes for servicing products made of industrial materials.

16.0 PERFORM INDUSTRIAL MATERIALS PREPROCESSING SKILLS--The student will be able to:

16.01 Locate and order industrial materials.
16.02 Arrange for the appropriate transportation of industrial materials.
16.03 Store and protect industrial materials properly.
16.04 Follow proper precautions in the receiving, unpacking, and handling of industrial materials.

17.0 PERFORM TECHNICAL PROCESSING SKILLS WITH WOOD MATERIALS--The student will be able to:

17.01 Apply the technical processes of separating and forming wood materials.
17.02 Apply the technical processes of conditioning wood materials.
17.03 Apply the technical processes of combining in the fabrication and finishing of a wood product.

18.0 PERFORM TECHNICAL PROCESSING SKILLS WITH METAL MATERIALS--The student will be able to:

18.01 Apply the technical processes of separating and forming metal materials.
18.02 Apply the technical processes of conditioning metal materials.
18.03 Apply the technical processes of combining in the fabrication and finishing of a metal product.

19.0 PERFORM TECHNICAL PROCESSING SKILLS WITH PLASTIC MATERIALS--The student will be able to:

19.01 Apply the technical processes of separating and forming plastic materials.
19.02 Apply the technical processes of conditioning plastic materials.
19.03 Apply the technical processes of combining in the fabrication and finishing of a plastic product.

20.0 PERFORM TECHNICAL PROCESSING SKILLS WITH OTHER INDUSTRIAL MATERIALS SUCH AS COMPOSITE MATERIALS, SYNTHETIC MATERIALS, FIBERGLASS, GLASS, CERAMICS, CEMENT, PAPER, RUBBER, PETROLEUM, POLYMERS AND OTHER INDUSTRIAL MATERIALS--The student will be able to:

20.01 Apply the technical processes of separating and forming other industrial materials.
20.02 Apply the technical processes of conditioning other industrial materials.
20.03 Apply the technical processes of combining in the fabrication and finishing of other industrial materials.

21.0 PERFORM INDUSTRIAL MATERIALS POSTPROCESSING SKILLS--The student will be able to:

21.01 Install a product made of industrial materials.
21.02 Perform technical maintenance on a product made of industrial materials.
21.03 Plan and design a technical alteration in a product made of industrial materials.
21.04 Identify businesses that specialize in the technical service of products made of industrial materials.

22.0 OPERATE A COMPUTER UTILIZING A PROGRAM RELATED TO INDUSTRIAL MATERIALS--The student will be able to:

22.01 Collect or produce data on industrial materials or processes through the operation of a computer.

23.0 PERFORM ADVANCED STUDY AND TECHNICAL SKILLS RELATED TO INDUSTRIAL MATERIALS AND PROCESSES--The student will be able to:

23.01 Select an individual or group project in cooperation with the teacher.
23.02 Develop a written plan of work to carry out the project.
23.03 Show evidence of technical study in support of the project.
23.04 Perform skills related to the project.
23.05 Complete the project as planned.

24.0 OPERATE A COMPUTER UTILIZING A PROGRAM RELATED TO INDUSTRIAL MATERIALS--The student will be able to:

24.01 Collect or produce data on industrial materials or processes through the operation of a computer.

25.0 PERFORM MATERIALS TESTING SKILLS--The student will be able to:

- 25.01 Perform technical destructive tests on industrial materials.
- 25.02 Perform technical nondestructive tests on industrial materials.

26.0 PERFORM A MATERIALS PROCESSING OPERATION USING A CNC (COMPUTER NUMERICAL CONTROLLED) MACHINE--The student will be able to:

- 26.01 Separate, form, or combine a part or subpart of a project using a CNC machine.
- 26.02 Interface a CNC machine and a robotic arm to perform automation processes.

27.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON AN INDUSTRIAL MATERIAL OR PROCESS--The student will be able to:

- 27.01 Identify a problem.
- 27.02 State a need to research the problem.
- 27.03 Form a hypothesis about the problem.
- 27.04 Plan the procedures for researching the problem.
- 27.05 Conduct the research following the planned procedures.
- 27.06 Present the research findings in a seminar.
- 27.07 State conclusions based on the research findings.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8601110
Course Title: Materials and Processes Technology I
Course Credit: 1

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations, and technical skills of industrial materials and processes technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;

- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.

07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 DEFINE THE PROCESSES RELATED TO INDUSTRIAL MATERIALS--The student will be able to:

12.01 Define "preprocessing."
12.02 Define "processing."
12.03 Define "postprocessing."

13.0 DESCRIBE PREPROCESSING ACTIVITIES AND PRACTICES--The student will be able to:

13.01 Describe the technical processes of extracting materials from natural resources.

13.02 Describe sources of standard stock materials.
13.03 Describe processes for transporting industrial materials.
13.04 Describe processes for storing industrial materials.
13.05 Describe industrial processes for protecting materials.
13.06 Describe precautions in receiving, unpacking, and handling industrial materials.

14.0 DESCRIBE PROCESSING TECHNOLOGIES AND PRACTICES OF INDUSTRIAL MATERIALS--The student will be able to:

14.01 Describe materials separating processes.
14.02 Describe materials forming processes.
14.03 Describe materials combining processes.
14.04 Describe materials conditioning processes.

15.0 DESCRIBE POSTPROCESSING TECHNOLOGIES AND PRACTICES OF INDUSTRIAL MATERIALS--The student will be able to:

15.01 Describe processes for distributing products made of industrial materials.
15.02 Describe processes for installing products made of industrial materials.
15.03 Describe processes for maintaining products made of industrial materials.
15.04 Describe processes for altering products made of industrial materials.
15.05 Describe processes for servicing products made of industrial materials.

16.0 PERFORM INDUSTRIAL MATERIALS PREPROCESSING SKILLS--The student will be able to:

16.01 Locate and order industrial materials.
16.02 Arrange for the appropriate transportation of industrial materials.
16.03 Store and protect industrial materials properly.
16.04 Follow proper precautions in the receiving, unpacking, and handling of industrial materials.

17.0 PERFORM TECHNICAL PROCESSING SKILLS WITH WOOD MATERIALS--The student will be able to:

17.01 Apply the technical processes of separating and forming wood materials.
17.02 Apply the technical processes of conditioning wood materials.
17.03 Apply the technical processes of combining in the fabrication and finishing of a wood product.

18.0 PERFORM TECHNICAL PROCESSING SKILLS WITH METAL MATERIALS--The student will be able to:

18.01 Apply the technical processes of separating and forming metal materials.
18.02 Apply the technical processes of conditioning metal materials.

18.03 Apply the technical processes of combining in the fabrication and finishing of a metal product.

19.0 PERFORM TECHNICAL PROCESSING SKILLS WITH PLASTIC MATERIALS--The student will be able to:

19.01 Apply the technical processes of separating and forming plastic materials.
19.02 Apply the technical processes of conditioning plastic materials.
19.03 Apply the technical processes of combining in the fabrication and finishing of a plastic product.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8601120
Course Title: Materials and Processes Technology II
Course Credit: 1

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations, and technical skills of industrial materials and processes technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  - integers, fractions, and decimals;
  - ratios, proportions, and percentages;
  - roots and powers;
  - algebra;

BEST COPY AVAILABLE

- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.

04.16 Use elementary concepts of probability and statistics.

04.17 Draw, read, and analyze graphs, charts, and tables.

04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.

04.19 Organize and communicate the results obtained by observation and experimentation.

04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).

04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.

05.03 Design and implement the optimal solution to a given problem.

05.04 Document each step of the design/problem-solving process.

05.05 Demonstrate "brainstorming" as a process to solve problems.

05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.

06.02 Explore methods used to monitor and correct performance of technological systems.

06.03 Design and implement an optimal solution to a given problem.

06.04 Outline major historical technological developments or events.

06.05 Identify recent advances in technology.

06.06 Explain problem-solving roles of technology.

06.07 Forecast a technological development or event.

06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.

07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.

07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.

07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

20.0 PERFORM TECHNICAL PROCESSING SKILLS WITH OTHER INDUSTRIAL MATERIALS SUCH AS COMPOSITE MATERIALS, SYNTHETIC MATERIALS, FIBERGLASS, GLASS, CERAMICS, CEMENT, PAPER, RUBBER, PETROLEUM, POLYMERS AND OTHER INDUSTRIAL MATERIALS--The student will be able to:

20.01 Apply the technical processes of separating and forming other industrial materials.
20.02 Apply the technical processes of conditioning other industrial materials.

20.03 Apply the technical processes of combining in the fabrication and finishing of other industrial materials.

21.0 PERFORM INDUSTRIAL MATERIALS POSTPROCESSING SKILLS--The student will be able to:

21.01 Install a product made of industrial materials.
21.02 Perform technical maintenance on a product made of industrial materials.
21.03 Plan and design a technical alteration in a product made of industrial materials.
21.04 Identify businesses that specialize in the technical service of products made of industrial materials.

22.0 OPERATE A COMPUTER UTILIZING A PROGRAM RELATED TO INDUSTRIAL MATERIALS--The student will be able to:

22.01 Collect or produce data on industrial materials or processes through the operation of a computer.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8601130
Course Title: Materials and Processes Technology III
Course Credit: 1

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations, and technical skills of industrial materials and processes technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  - integers, fractions, and decimals;
  - ratios, proportions, and percentages;
  - roots and powers;
  - algebra;

- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.

07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

23.0 PERFORM ADVANCED STUDY AND TECHNICAL SKILLS RELATED TO INDUSTRIAL MATERIALS AND PROCESSES--The student will be able to:

23.01 Select an individual or group project in cooperation with the teacher.
23.02 Develop a written plan of work to carry out the project.
23.03 Show evidence of technical study in support of the project.
23.04 Perform skills related to the project.
23.05 Complete the project as planned.

24.0 OPERATE A COMPUTER UTILIZING A PROGRAM RELATED TO INDUSTRIAL MATERIALS--The student will be able to:

24.01 Collect or produce data on industrial materials or processes through the operation of a computer.

25.0 PERFORM MATERIALS TESTING SKILLS--The student will be able to:

25.01 Perform technical destructive tests on industrial materials.
25.02 Perform technical nondestructive tests on industrial materials.

26.0 PERFORM A MATERIALS PROCESSING OPERATION USING A CNC (COMPUTER NUMERICAL CONTROLLED) MACHINE--The student will be able to:

26.01 Separate, form, or combine a part or subpart of a project using a CNC machine.
26.02 Interface a CNC machine and a robotic arm to perform automation processes.

27.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON AN INDUSTRIAL MATERIAL OR PROCESS--The student will be able to:

27.01 Identify a problem.
27.02 State a need to research the problem.
27.03 Form a hypothesis about the problem.
27.04 Plan the procedures for researching the problem.
27.05 Conduct the research following the planned procedures.
27.06 Present the research findings in a seminar.
27.07 State conclusions based on the research findings.

July 1997

Florida Department of Education
CURRICULUM FRAMEWORK

Program Title:	Power and Transportation Technology
Occupational Area:	Technology Education
	Secondary
Program Numbers	**8601200**
CIP Number	0821.010500
Grade Level	9-12, 30, 31
Length	3 credits
Certification	INDUS ARTS @4 6 AUTO MECH @7G TEC MECH @7G GEN SHOP @4 DESEL MECH @7G AIR MECH @7G TRANSPORT @4 AUTO IND @7G GASENG RPR @7G I ART-TEC 1 @2

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this program is to provide students with a foundation of knowledge and technically oriented experiences in the study of power and transportation technology. This program focuses on transferable skills and stresses understanding and demonstration of the technological tools, machines, instruments, materials, processes and systems in business and industry.

The content includes, but is not limited to, a study of power systems and the kinds and sources of energy. The content and activities will also include the study of entrepreneurship, safety, and leadership skills.

Listed below are the courses that make up this program. Design code 243 is the appropriate laboratory facility for this program.

8601210 - Power and Transportation Technology I
8601220 - Power and Transportation Technology II
8601230 - Power and Transportation Technology III

II. **LABORATORY ACTIVITIES**: Instruction and learning activities are provided in a laboratory setting using hands-on experiences with the tools and materials appropriate to the course content.

III. **SPECIAL NOTE**: The Florida Technology Student Association (FL-TSA)is the appropriate vocational student organization for providing leadership training experiences and reinforcing specific vocational skills. Vocational student organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

The Level II and Level III courses in this program may articulate into postsecondary Tech-Prep 2 + 2 programs when taken in sequence. Tech-Prep 2 + 2 programs require articulation agreements between secondary and postsecondary educational agencies.

In accordance with HB 2489 - Section 42, approved by the Florida Legislature and signed into law June 16, 1995, Technology Education students who have completed a minimum of three sequential credits in an eligible technology education program by the end of school year 1995-96 and thereafter will be eligible for the Gold Seal designation. The student must also continue in a planned, related post secondary education program.

IV. **INTENDED OUTCOMES:** After successfully completing this program, the student will be able to:

01.0 Demonstrate the ability to work safely with a variety of technologies.
02.0 Demonstrate interpersonal skills as they relate to the workplace.
03.0 Identify and apply methods of information acquisition and utilization.
04.0 Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05.0 Demonstrate and apply design/problem-solving processes.
06.0 Express an understanding of technological systems and their complex interrelationships.
07.0 Demonstrate the ability to properly identify, organize, plan, and allocate resources.
08.0 Discuss individual interests and aptitudes as they relate to a career.
09.0 Demonstrate employability skills.
10.0 Demonstrate an understanding of entrepreneurship.
11.0 Make an informed and meaningful career choice.
12.0 Describe sources of energy.
13.0 Demonstrate technical knowledge and skills about steam power technology.
14.0 Demonstrate technical knowledge and skills about diesel engine power technology.
15.0 Demonstrate technical knowledge and skills about internal combustion power technology.
16.0 Demonstrate technical knowledge and skills about hydraulic and pneumatic power technology.
17.0 Demonstrate technical knowledge and skills about electric power technology.
18.0 Demonstrate technical knowledge and skills about jet engine power technology.
19.0 Demonstrate technical knowledge and skills about rocket engine power technology.
20.0 Demonstrate technical knowledge and skills about solar cells and fuel cells.
21.0 Demonstrate technical knowledge and skills about nuclear power technology.

22.0 Perform advanced study and technical skills related to energy and power.

23.0 Operate a computer utilizing a program related to energy and power.

24.0 Demonstrate technical knowledge and skills about powered transportation systems.

25.0 Measure and report the power and efficiency of power producing systems.

26.0 Conduct a research and experimentation project on an energy and power system.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Power And Transportation Technology
Secondary Number: 8601200
Postsecondary Number:

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.

BEST COPY AVAILABLE

03.03 Discuss advantages and disadvantages in the application of technologies.

03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.

03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.

04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.

04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.

04.04 Distinguish fact from opinion.

04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.

04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.

04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.

04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.

04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.

04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.

04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.

04.14 Use the mathematics of:

- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.

04.16 Use elementary concepts of probability and statistics.

04.17 Draw, read, and analyze graphs, charts, and tables.

04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.

04.19 Organize and communicate the results obtained by observation and experimentation.

04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).

04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.

05.03 Design and implement the optimal solution to a given problem.

05.04 Document each step of the design/problem-solving process.

05.05 Demonstrate "brainstorming" as a process to solve problems.

05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.

06.02 Explore methods used to monitor and correct performance of technological systems.

06.03 Design and implement an optimal solution to a given problem.

06.04 Outline major historical technological developments or events.

06.05 Identify recent advances in technology.

06.06 Explain problem-solving roles of technology.

06.07 Forecast a technological development or event.

06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.

07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.

07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.

07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 DESCRIBE SOURCES OF ENERGY--The student will be able to:

12.01 Describe sources of thermal energy.
12.02 Describe sources of radiant energy.
12.03 Describe sources of nuclear energy.
12.04 Describe sources of chemical energy.
12.05 Describe sources of electrical energy.
12.06 Describe sources of mechanical energy.
12.07 Describe sources of fluid energy.

13.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT STEAM POWER TECHNOLOGY--The student will be able to:

13.01 Identify and define the key terms, categories, and parts of steam power technology.
13.02 Describe the operating theory and principles of steam engines and steam turbines.

13.03 Explain the uses and applications of steam power engines and systems.
13.04 Identify industries that produce and use steam power systems.
13.05 Describe energy and fuel sources for steam power operations.
13.06 Perform technical skills in building, assembling, maintaining, or operating a steam power system.

14.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT DIESEL ENGINE POWER TECHNOLOGY--The student will be able to:

14.01 Identify and define key terms, categories, and parts of diesel engine power technology.
14.02 Describe the operating theory and principles of diesel engine power technology.
14.03 Explain the uses and applications of diesel engines.
14.04 Identify industries that produce and use diesel engines.
14.05 Describe energy and fuel sources for diesel engines.
14.06 Perform technical skills in building, assembling, maintaining, or operating diesel engines.

15.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT INTERNAL COMBUSTION POWER TECHNOLOGY--The student will be able to:

15.01 Identify and define the key terms, categories, and parts of gasoline engine internal combustion technology.
15.02 Describe the operating theory and principles of internal combustion gasoline engines.
15.03 Explain the uses and applications of internal combustion gasoline engines.
15.04 Identify industries that produce and use internal combustion gasoline engines.
15.05 Describe energy and fuel sources for internal combustion gasoline engines.
15.06 Perform technical skills in building, assembling, maintaining, or operating internal combustion gasoline engines.

16.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT HYDRAULIC AND PNEUMATIC POWER TECHNOLOGY--The student will be able to:

16.01 Identify and define key terms, categories, and parts of hydraulic and pneumatic power technology.
16.02 Describe the operating theory and principles of hydraulic and pneumatic power technology.
16.03 Explain the uses and applications of hydraulic and pneumatic power systems.
16.04 Identify industries that produce and use hydraulic and pneumatic power systems.
16.05 Describe the energy sources for hydraulic and pneumatic power systems.
16.06 Perform technical skills in building, assembling, maintaining, or operating hydraulic and pneumatic power systems.

17.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT ELECTRIC POWER TECHNOLOGY--The student will be able to:

17.01 Identify and define the key terms, categories, and parts of electric power technology.
17.02 Describe the operating theory and principles of electric power systems.
17.03 Explain the uses and applications of electric power systems.
17.04 Identify industries that produce and use electric power systems.
17.05 Describe energy and fuel sources for electric power systems.
17.06 Perform technical skills in building, assembling, maintaining, or operating an electric power system.

18.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT JET ENGINE POWER TECHNOLOGY--The student will be able to:

18.01 Identify and define key terms, categories, and parts of jet engine power technology.
18.02 Describe the operating theory and principles of jet engine power technology.
18.03 Explain the uses and applications of jet engines.
18.04 Identify industries that produce and use jet engines.
18.05 Describe energy and fuel sources for jet engines.
18.06 Perform technical skills in building, assembling, maintaining, or operating jet engines.

19.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT ROCKET ENGINE POWER TECHNOLOGY--The student will be able to:

19.01 Identify and define key terms, categories, and parts of rocket engine power technology.
19.02 Describe the operating theory and principles of rocket engine power technology.
19.03 Explain the uses and applications of rocket engines.
19.04 Identify industries that produce and use rocket engines.
19.05 Describe energy and fuel sources for rocket engines.
19.06 Perform technical skills in building, assembling, maintaining, or operating rocket engines.

20.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT SOLAR CELLS AND FUEL CELLS--The student will be able to:

20.01 Identify and define key terms, categories, and parts of solar cell and fuel cell power technology.
20.02 Describe the operating theory and principles of solar cell and fuel cell power technology.
20.03 Explain the uses and applications of solar cell and fuel cell power technology.
20.04 Identify the industries that produce and use solar cell and fuel cell power systems.
20.05 Describe the energy and fuel sources for solar cell and fuel cell power systems.
20.06 Perform technical skills in building, assembling, maintaining, or operating solar cell or fuel cell systems.

21.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT NUCLEAR POWER TECHNOLOGY--The student will be able to:

21.01 Identify and define the key terms, categories, and parts of nuclear power technology.
21.02 Describe the operating theory and principles of nuclear power systems.
21.03 Explain the uses and applications of nuclear power systems.
21.04 Identify industries that produce and use nuclear power systems.
21.05 Describe energy and fuel sources for nuclear power systems.
21.06 Perform technical skills in building, assembling, maintaining, or operating a simulated or real nuclear power system.

22.0 PERFORM ADVANCED-STUDY AND TECHNICAL SKILLS RELATED TO ENERGY AND POWER TECHNOLOGY--The student will be able to:

22.01 Select an individual or group project in cooperation with the teacher.
22.02 Develop a written plan of work to carry out the project.
22.03 Show evidence of technical study in support of the project.
22.04 Perform skills related to the project.
22.05 Complete the project as planned.

23.0 OPERATE A COMPUTER UTILIZING A PROGRAM RELATED TO ENERGY AND POWER--The student will be able to:

23.01 Collect or produce data on energy and power through the operation of a computer.

24.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT POWERED TRANSPORTATION SYSTEMS--The student will be able to:

24.01 Identify and define key terms, categories, and parts of land, water, air, and space transportation systems.
24.02 Describe the theories and operating principles of land, water, air, and space transportation.
24.03 Explain the uses and applications of land, water, air and space transportation vehicles.
24.04 Identify industries that produce and use land, water, air, and space transportation vehicles.
24.05 Describe the energy and power systems used in land, water, air, and space vehicles.
24.06 Perform technical skills in building, assembling, servicing, or operating a complete transportation vehicle.

25.0 MEASURE AND REPORT THE POWER AND EFFICIENCY OF POWER PRODUCING SYSTEMS--The student will be able to:

25.01 Measure the power and efficiency of a mechanical system.
25.02 Measure the power and efficiency of a fluid system.
25.03 Measure the power and efficiency of an electrical system.
25.04 Measure the power and efficiency of a thermal system.

26.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON AN ENERGY AND POWER SYSTEM--The student will be able to:

26.01 Identify a problem.
26 02 State a need to research the problem.
26.03 Form a hypothesis about the problem.
26.04 Plan the procedures for researching the problem.
26.05 Conduct the research following the planned procedures.
26.06 Present the research findings in a seminar.
26.07 State conclusions based on the research findings.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8601210
Course Title: Power and Transportation Technology I
Course Credit: 1

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations, and technical skills of energy and power technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 DESCRIBE SOURCES OF ENERGY--The student will be able to:

12.01 Describe sources of thermal energy.
12.02 Describe sources of radiant energy.
12.03 Describe sources of nuclear energy.
12.04 Describe sources of chemical energy.
12.05 Describe sources of electrical energy.
12.06 Describe sources of mechanical energy.
12.07 Describe sources of fluid energy.

13.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT STEAM POWER TECHNOLOGY--The student will be able to:

13.01 Identify and define the key terms, categories, and parts of steam power technology.
13.02 Describe the operating theory and principles of steam engines and steam turbines.
13.03 Explain the uses and applications of steam power engines and systems.
13.04 Identify industries that produce and use steam power systems.
13.05 Describe energy and fuel sources for steam power operations.
13.06 Perform technical skills in building, assembling, maintaining, or operating a steam power system.

14.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT DIESEL ENGINE POWER TECHNOLOGY--The student will be able to:

14.01 Identify and define key terms, categories, and parts of diesel engine power technology.
14.02 Describe the operating theory and principles of diesel engine power technology.
14.03 Explain the uses and applications of diesel engines.
14.04 Identify industries that produce and use diesel engines.
14.05 Describe energy and fuel sources for diesel engines.
14.06 Perform technical skills in building, assembling, maintaining, or operating diesel engines.

15.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT INTERNAL COMBUSTION POWER TECHNOLOGY--The student will be able to:

15.01 Identify and define the key terms, categories, and parts of gasoline engine internal combustion technology.
15.02 Describe the operating theory and principles of internal combustion gasoline engines.
15.03 Explain the uses and applications of internal combustion gasoline engines.
15.04 Identify industries that produce and use internal combustion gasoline engines.
15.05 Describe energy and fuel sources for internal combustion gasoline engines.
15.06 Perform technical skills in building, assembling, maintaining, or operating internal combustion gasoline engines.

July 1997

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8601220
Course Title: Power and Transportation Technology II
Course Credit: 1

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations, and technical skills of energy and power technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;

BEST COPY AVAILABLE

- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.

04.16 Use elementary concepts of probability and statistics.

04.17 Draw, read, and analyze graphs, charts, and tables.

04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.

04.19 Organize and communicate the results obtained by observation and experimentation.

04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).

04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.

05.03 Design and implement the optimal solution to a given problem.

05.04 Document each step of the design/problem-solving process.

05.05 Demonstrate "brainstorming" as a process to solve problems.

05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.

06.02 Explore methods used to monitor and correct performance of technological systems.

06.03 Design and implement an optimal solution to a given problem.

06.04 Outline major historical technological developments or events.

06.05 Identify recent advances in technology.

06.06 Explain problem-solving roles of technology.

06.07 Forecast a technological development or event.

06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.

07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.

07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.

BEST COPY AVAILABLE

07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

16.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT HYDRAULIC AND PNEUMATIC POWER TECHNOLOGY--The student will be able to:

16.01 Identify and define key terms, categories, and parts of hydraulic and pneumatic power technology.
16.02 Describe the operating theory and principles of hydraulic and pneumatic power technology.
16.03 Explain the uses and applications of hydraulic and pneumatic power systems.
16.04 Identify industries that produce and use hydraulic and pneumatic power systems.

16.05 Describe the energy sources for hydraulic and pneumatic power systems.
16.06 Perform technical skills in building, assembling, maintaining, or operating hydraulic and pneumatic power systems.

17.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT ELECTRIC POWER TECHNOLOGY--The student will be able to:

17.01 Identify and define the key terms, categories, and parts of electric power technology.
17.02 Describe the operating theory and principles of electric power systems.
17.03 Explain the uses and applications of electric power systems.
17.04 Identify industries that produce and use electric power systems.
17.05 Describe energy and fuel sources for electric power systems.
17.06 Perform technical skills in building, assembling, maintaining, or operating an electric power system.

18.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT JET ENGINE POWER TECHNOLOGY--The student will be able to:

18.01 Identify and define key terms, categories, and parts of jet engine power technology.
18.02 Describe the operating theory and principles of jet engine power technology.
18.03 Explain the uses and applications of jet engines.
18.04 Identify industries that produce and use jet engines.
18.05 Describe energy and fuel sources for jet engines.
18.06 Perform technical skills in building, assembling, maintaining, or operating jet engines.

19.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT ROCKET ENGINE POWER TECHNOLOGY--The student will be able to:

19.01 Identify and define key terms, categories, and parts of rocket engine power technology.
19.02 Describe the operating theory and principles of rocket engine power technology.
19.03 Explain the uses and applications of rocket engines.
19.04 Identify industries that produce and use rocket engines.
19.05 Describe energy and fuel sources for rocket engines.
19.06 Perform technical skills in building, assembling, maintaining, or operating rocket engines.

20.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT SOLAR CELLS AND FUEL CELLS--The student will be able to:

20.01 Identify and define key terms, categories, and parts of solar cell and fuel cell power technology.
20.02 Describe the operating theory and principles of solar cell and fuel cell power technology.
20.03 Explain the uses and applications of solar cell and fuel cell power technology.

20.04 Identify the industries that produce and use solar cell and fuel cell power systems.
20.05 Describe the energy and fuel sources for solar cell and fuel cell power systems.
20.06 Perform technical skills in building, assembling, maintaining, or operating solar cell or fuel cell systems.

21.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT NUCLEAR POWER TECHNOLOGY--The student will be able to:

21.01 Identify and define the key terms, categories, and parts of nuclear power technology.
21.02 Describe the operating theory and principles of nuclear power systems.
21.03 Explain the uses and applications of nuclear power systems.
21.04 Identify industries that produce and use nuclear power systems.
21.05 Describe energy and fuel sources for nuclear power systems.
21.06 Perform technical skills in building, assembling, maintaining, or operating a simulated or real nuclear power system.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8601230
Course Title: Power and Transportation Technology III
Course Credit: 1

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations, and technical skills of energy and power technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  - integers, fractions, and decimals;
  - ratios, proportions, and percentages;
  - roots and powers;
  - algebra;

- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.

BEST COPY AVAILABLE

07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

22.0 PERFORM ADVANCED-STUDY AND TECHNICAL SKILLS RELATED TO ENERGY AND POWER TECHNOLOGY--The student will be able to:

22.01 Select an individual or group project in cooperation with the teacher.
22.02 Develop a written plan of work to carry out the project.
22.03 Show evidence of technical study in support of the project.
22.04 Perform skills related to the project.
22.05 Complete the project as planned.

23.0 OPERATE A COMPUTER UTILIZING A PROGRAM RELATED TO ENERGY AND POWER--The student will be able to:

23.01 Collect or produce data on energy and power through the operation of a computer.

24.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT POWERED TRANSPORTATION SYSTEMS--The student will be able to:

24.01 Identify and define key terms, categories, and parts of land, water, air, and space transportation systems.
24.02 Describe the theories and operating principles of land, water, air, and space transportation.
24.03 Explain the uses and applications of land, water, air and space transportation vehicles.
24.04 Identify industries that produce and use land, water, air, and space transportation vehicles.
24.05 Describe the energy and power systems used in land, water, air, and space vehicles.
24.06 Perform technical skills in building, assembling, servicing, or operating a complete transportation vehicle.

25.0 MEASURE AND REPORT THE POWER AND EFFICIENCY OF POWER PRODUCING SYSTEMS--The student will be able to:

25.01 Measure the power and efficiency of a mechanical system.
25.02 Measure the power and efficiency of a fluid system.
25.03 Measure the power and efficiency of an electrical system.
25.04 Measure the power and efficiency of a thermal system.

26.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON AN ENERGY AND POWER SYSTEM--The student will be able to:

26.01 Identify a problem.
26.02 State a need to research the problem.
26.03 Form a hypothesis about the problem.
26.04 Plan the procedures for researching the problem.
26.05 Conduct the research following the planned procedures.
26.06 Present the research findings in a seminar.
26.07 State conclusions based on the research findings.

IA 483 BK 97

GREAT SEAL OF THE STATE OF FLORIDA

IN GOD WE TRUST